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ABSTRACT

The full-time equivalent enrollment (FTEE) has been a significant factor to Iowa's 15 area community colleges for cost analysis, production comparisons, and for the distribution of state aid. The FTEE formula calculates units of production according to the ratio of reimbursable contact hours (RCH) to total contact hours generated by student attendance. For this study, annual budget data from all 504 vocational programs in the Iowa community colleges were analyzed to test the hypothesis that there was a significant difference in the mean RCH of programs among the 15 merged area colleges, caused by allowing flexibility in formula application when calculating FTEE. The results showed statistical differences in the mean percents of RCH of vocational programs among the colleges. A literature review revealed that the Florida and Texas community college systems had existing funding methodologies that were based on reliable units of measurement. It was concluded that: (1) the funding methodology used to distribute state aid moved away from program production accountability when cost-based funding was adopted for 1979; (2) the FTEE formula was an unreliable unit of measurement; and (3) the student contact hour, credit hour, or FTEE were acceptable provided that there was a standard definition for each. Appendices contain data analysis forms plus the Florida and Texas models. (Author/MB)

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An Analysis of the Equitability of the Full-time Equivalent Enrollment Formula for the Distribution of State Aid Among Iowa Community Colleges

EUGENE F. SCHORZMANN

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April 11, 1979 — Date

Eugene E. DuBois — Dr. Eugene E. DuBois
CENTRAL STAFF COMMITTEE MEMBER

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Abstract of a Major Applied Research Project Presented to Nova University in Partial Fulfillment of the Requirements for the Degree of Doctor of Education

AN ANALYSIS OF THE EQUITABILITY OF THE FULL-TIME EQUIVALENT ENROLLMENT FORMULA FOR THE DISTRIBUTION OF STATE AID AMONG IOWA COMMUNITY COLLEGES

by

Eugene F. Schorzmann

April, 1979

The full-time equivalent enrollment (FTEE), as the unit of measurement of production, was a very significant factor to Iowa's 15 area community colleges for cost analysis, production comparisons, and for the distribution of state general aid since the community colleges were initiated in 1966. The FTEE formula procedure calculated units of production according to the ratio of reimbursable contact hours (RCH) to total contact hours generated by student attendance. As programs were submitted to the Department of Public Instruction and the State Board of Public Instruction for initial approval, little or no attention was paid to the formula and to the effects that the flexibility would have on the number of FTEE generated. Almost total attention was given to the relevancy of the content compared to the objectives of the training programs to meet the needs of the people for which the programs were designed. The problem was that evidence existed which indicated that the use of the FTEE formula did not provide for an equitable distribution of state aid funds among the community colleges.

The issue of this research paper was the equitable distribution of state aid funds to the merged area schools. The focus or central problem of this study was the current FTEE formula and its application. To analyze this problem, it was imperative to:

1. gain an understanding of the development of the FTEE formula.
2. determine if the application of the formula would, in fact, create a probable inequitable distribution of state aid funds.
3. determine if there were other extant models or formulas for the distribution of state aid funds.

One hypothesis was formulated and tested by applying the F Test, the Duncan Multiple Range Analysis, and the t Statistic. The hypothesis stated that there was a significant difference in the mean percent of RCH among programs comparing the 15 merged area colleges, which was caused by allowing flexibility in formula application when calculating FTEE. The result of such significant differences would be incorrect program cost comparisons, and therefore, an inequitable distribution of state general aid would result.

The sample included all 504 vocational programs in the Iowa community colleges. The data needed to address the issues in this study were recorded on forms which were designed and which appear in the appendices. The data were obtained from the annual budget analysis from the Department of Public Instruction pertaining to the production and cost comparisons for specific programs at specific community colleges, from the vocational division of the Department of Public Instruction, from minutes of various committees and groups, and from other governmental publications.

The results of the F Test showed that the null hypothesis was rejected at the .05 level. There were significant differences in the mean percents of RCH of vocational programs among the 15 merged area colleges.

The Duncan Multiple Range Test showed that 19 of the 105 comparisons had significantly different mean RCH. The t Statistic revealed that eight of the 15 community colleges varied significantly at the .05 level from the grand mean of all 15 community colleges. The literature search revealed that the Florida community college system and the Texas community college system were two examples of existing funding methodologies that were based on reliable units of measurement.

Three conclusions were drawn from this study. The first was that the funding methodology used to distribute state aid among Iowa's area community colleges moved away from program production accountability when cost-based program funding was adopted for FY 1979. The second conclusion was that the FTEE formula was an unreliable unit of measurement and that it resulted in some colleges generating more or less FTEE than they had generated. The result was an inequitable distribution of state aid. The third conclusion was that the student contact hour, credit hour, or FTEE were all acceptable units of measurement provided that there was a standard definition for each and that the student contact hour was the basis on which to calculate credit and/or FTEE.

The three recommendations which resulted from this study included the following:

1. FTEE should be continued as the unit of measurement for Iowa's community colleges because it is a meaningful unit of production to educators, legislators, and other citizens. The contact hour should be the basis on which FTEE's are computed with no formula conversions.

2. The future funding methodology for the distribution for state general aid among Iowa's community colleges should be cost-based program funding accompanied by minimum production standards to encourage program relevance, cost-efficiency, and accountability.

3. The extant funding methodologies and the calculation procedures used by the Florida and Texas community college systems for FY 1979 were good models to study for those responsible for designing Iowa's next funding methodology.

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Chapter 1

INTRODUCTION

Background and Significance

Iowa's area community colleges constituted a statewide system of 15 public two-year post-secondary institutions. Each area school served a multi-county merged area which varied in size from four to 11 counties (See Appendix A). All area schools offered comprehensive educational programs to all residents and nonresidents including vocational, arts and science, and continuing education. These comprehensive educational program opportunities were made possible by Senate File 550 which was passed by the Iowa Legislature in 1965.

Each area college was operated by a locally elected Board of Directors. Each director was elected to represent a director district.

The State Board of Public Instruction had the responsibility for providing leadership to area colleges as well as K-12 districts and for regulation of these institutions. The State Board, in conjunction with the Board of Regents, also had the responsibility for developing standards for area colleges. The State Board was advised on the operation of area schools by a nine-member state advisory committee on area schools which was established by statute and approved by the governor.

Since the formation of the area community college system in 1966, state general aid had been requested on a biennium basis to partially fund them. State general aid was an addition to the other sources of income

which included tuition and fees, federal and state vocational aid, and a 3/4 mill tax levy on all real property within the geographical area within the boundaries of each community college district.

Yeager (1973) showed that the state of Iowa had utilized a series of funding formulas to disburse state aid funds to community colleges. Different formulas were used for the periods of 1966-69; 1969-71; 1971-73; 1973-75; and, 1975-77. Each funding formula was revised or discarded because of inherent problems and weaknesses. A sixth formula was devised for 1977-79, which was currently in use.

Funding methodologies and formulas to determine units of production had a direct impact upon the curriculum and organization of schools. The full-time equivalent enrollment (FTEE) formula utilized by the Iowa Department of Public Instruction had a direct relationship to the structure and implementation of courses of study at Iowa's community colleges.

The FTEE formula, as the unit of measurement of production, was a very significant factor to Iowa's area colleges for cost analysis, FTEE comparisons, and for the distribution of state general aid since the area schools were initiated in 1966. Although the definition of FTEE changed, it was continued as the unit of measurement of production for the community colleges in Iowa.

However, as programs were submitted to the Department of Public Instruction and the State Board of Public Instruction for approval, little or no attention was paid to the FTEE formula which was used to calculate the unit of production according to the ratio of reimbursable contact hours (RCH) to contact hours generated by student attendance. Almost total attention was given to the relevancy of the content compared to the objectives of the programs for meeting the needs of the people for which

the programs were designed. As a result, there was little consistency between the ratio of RCH to contact hours in programs with identical taxonomy numbers among community colleges.

The vocational directors of the community colleges, the community college branch of the Iowa Department of Public Instruction, and the Vocational Education Advisory Council for Iowa expressed concern about the impact that the inconsistent application of the FTEE formula was having on the distribution of state aid, cost comparisons, and FTEE comparisons. This concern was shared by Iowa Lakes Community College.

The problem was that evidence existed which indicated that the use of the FTEE formula was not providing for an equitable distribution of state aid funds among the community colleges.

Because of the complex evolution of Iowa's community college funding methodology and because of the concerns expressed by several colleges, the superintendents, in cooperation with the Department of Public Instruction, established an FTEE Review Committee in January of 1978 (See Appendix B).

The scope of the problems related to the current FTEE formula was clearly delineated in the documents and reports of the FTEE Review Committee. In a memorandum dated June 26, 1978, a list of 13 specific problems (See Appendix C) related to the FTEE formula was provided to the members of the committee as a compilation of the concerns expressed at the committee's meeting of June 20, 1978.

On August 18, 1978, the Area Schools Division of the Department of Public Instruction sent a memorandum to the FTEE Review Committee. This memorandum exposed a situation (See Appendix D) where a program was restructured in a way which generated additional RCH without either changing

the program's objectives or length. This restructuring was construed as a possible manipulation of the FTEE formula to generate a greater state aid reimbursement for that program.

The annual report of the Iowa Vocational Education Advisory Council (1978, Pages 16-17) made the following acknowledgment and recommendations as paraphrased: The budgeting process should be established in which the base unit is arts and science. Other educational functions of vocational programs and adult education would be compared to this base and the additional funds needed would be covered through the state general aid request. However, a need existed to standardize the allowable number of FTEE a given program could produce per enrollment.

With that background, the purposes of this study were to describe the history of the FTEE formula, to analyze the results of Iowa's community college FTEE formula, and to identify other extant funding methodologies among other state community college systems which might be adaptable and more equitable for use in Iowa.

The research methodologies utilized in this study included elements of the historical literature search, statistical analysis among variables, case study, and descriptive.

The FTEE, as a unit of measurement, carried a great deal of significance to Iowa Lakes Community College because it was the basis for such evaluative comparisons as program cost and FTEE generated.

The comparative program costs and the number of FTEE generated by program were significant data to the State Department of Public Instruction and the legislature as they evaluated community college productivity and program validity when they considered state general aid appropriations for the succeeding biennium.

An example of the importance of the FTEE was during the 1975-77 biennium. One of the greatest impacts on community colleges of the formula approach was the increased focus on program costs. The formula recognized average FTEE costs, and this had the effect of penalizing area schools that had higher than average costs by decreasing their state aid to move them toward the average. Some argued that this approach was necessary to encourage cost efficiency, while others protested that it was unfair to area schools that generally served more rural areas with lower concentrations of population. It would have the tendency to encourage institutions to start relatively inexpensive programs rather than programs that had a higher priority and a higher cost.

Another significant factor of the FTEE as the unit of measurement of production was that the ratio of lecture compared to laboratory and cooperative contact hours within courses in vocational and technical programs affected the FTEE generated by a student.

Research Questions

The issue of this research paper was the equitable distribution of state aid funds to the merged area schools. The focus or central problem of this study was the current FTEE formula and its application. To analyze this problem, it was imperative to: 1) gain an understanding of the development of the FTEE formula; 2) determine if the application of the formula would, in fact, create a probable inequitable distribution of state aid funds; and, 3) determine if there were alternative models or formulas available for the distribution of state aid funds.

The three research questions for this study were:

1. How did the current FTEE formula evolve?

2. Was there a significant difference in the mean percent of RCH among programs comparing the 15 merged area colleges which was caused by allowing flexibility in formula application when calculating FTEE resulting in incorrect program cost comparisons and inequitable state general aid distribution?

3. Were there other existing funding methodologies of proven effectiveness for the distribution of state aid funds?

The types of information needed to address these questions included: historical and background documents on the development of Iowa's state aid reimbursement formulas; documents pertaining to the disbursement of state aid funds for specific programs at specific merged area schools; and documents and literature pertaining to funding practices of state governments for the support of community colleges. These data existed within the documents of the Department of Public Instruction, the merged area schools, various committees and groups, other governmental publications, the FTEE Review Committee, and the reports and publications of various researchers and scholars. A reference list of these materials and appendices have been included.

It was important to understand the development of the FTEE formula in order to place the formula in perspective. The current FTEE formula evolved through the solution of certain problems. These problems had to be identified and considered in the development of a new formula in order to avoid their reoccurence.

It was imperative to establish whether the application of the current FTEE formula did engender an inequitable distribution of state aid funds. If the formula did engender an inequitable distribution of aid, then there was a demonstrable basis for its modification or replacement.

It was also important that extant alternative formulas or methodologies which could be used to modify or replace the current FTEE formula

be identified. If alternatives did exist, they needed to be identified and reviewed for possible use in the construction of a new methodology for Iowa.

Relevance and Statement of the Hypothesis

The FTEE formula had a direct relationship to the structure and implementation of courses of study at Iowa's community colleges. Flexibility in the number of RCH claimed in programs with identical taxonomies among the area colleges may have resulted in an inequitable distribution of state aid and inaccurate cost and production comparisons. The hypothesis was: There were significant differences at the .05 percent level among the mean percents of RCH among the area colleges.

Definitions

Career-option program:

A transfer program in the arts and sciences division that awards transfer credit, but also prepares students for job entry.

Contact hour:

Each clock hour, including passing time, a student is in an officially scheduled class session for which he is registered.

Contact hour of coop:

A contact hour of practical work experience related to a field of study.

Contact hour of laboratory:

A contact hour of demonstration by the instructor and experimentation or development of manipulative skills by students.

Contact hour of lecture:

A contact hour of classroom lecture and/or discussion.

Cooperative Education:

Cooperative Education is that type of education which exposes the student to periods of employment in business, industry, and government in which the two phases of learning relate to one another in a planned manner and in which the institution takes the primary responsibility for the total educational program.

Cost center:

A budgetary unit such as program discipline.

Direct costs:

Those costs resulting from providing the instructional programs including instructional salaries, educational supplies, instructor travel, and all other expenses directly related to classroom instruction.

Fiscal year (FY):

The budgetary period consisting of twelve months which begins July 1 and ends June 30.

Full-time equivalent enrollment (FTEE):

The quotient of the total number of reimbursable contact hours of students attending a single area school, divided by 540, which represents 15 reimbursable hours per week for a period of 36 weeks.

Indirect costs:

Those costs resulting from providing supportive services.

Reimbursable contact hour (RCH):

Shall mean any of the following:

1. Two contact hours of laboratory in an approved course in arts and science or vocational-technical education.

2. One contact hour of lecture in an approved course in arts and science or vocational-technical education.

3. One contact hour of lecture in an approved course in adult basic education.

4. One contact hour of lecture in an approved course in high school completion.

5. Two contact hours in an approved course in general adult and continuing education.

Support services:

Those services such as student services, administration, learning resources, and facilities which are furnished in addition to the instructional program.

Limitations

1. This study focused only on the impact that the independent variable, which was the FTEE formula, had on the dependent variable which was state aid. It did not deal with the impact of other independent variables such as teacher-student ratios, varying teacher salaries caused by seniority and salary schedule differences, varying supportive services, and varying facility operational expenses.

2. The results of this study were most relevant to Iowa community colleges although the research design could be easily adaptable for use in other states.

Assumptions

1. All community colleges were actually carrying out the curriculum of their individual programs as reflected on their AS-28 curriculum guides on file at the Department of Public Instruction.

2. There was a difference in the course structure within programs of identical taxonomies which resulted in differing rates of FTEE generated between colleges.

3. It was desirable to support FTEE units of production from programs with identical taxonomies with the same amount of financial resources with the proper allowance for independent variables such as instructor salary differential between schools due to seniority, educational background, experience background,

schedule differential, level of supportive services to students, and facility differences. The Iowa community colleges did not have a uniform salary schedule. Therefore, base salaries varied. Traditionally, salary schedules rewarded teachers for years of experience and educational achievement levels beyond the minimum certification requirements. For these reasons, instructor salary cost will vary among several schools with an identical program.

4. It was desirable to allow flexibility in program content and length between college programs with identical taxonomies to meet the needs of the people served and to avoid decisions which would influence statewide curriculum standardization.

5. It was desirable to standardize the allowable number of FTEE a given program can produce per enrollment based on a reliable unit of measurement.

Chapter 2

REVIEW OF LITERATURE

Community College Budgeting Philosophy

To establish a correlation between costs, productivity, and activities is the prime budgeting methodology and evaluation system in community colleges. Therefore, it was important to review in depth the Programming, Planning, and Budgeting System (PPBS) as a fundamental background for budgeting and evaluation procedures.

Toler (1976) reviewed the implications of the PPBS for curriculum planning and decisions at the community college level. PPBS arrived on the college campuses approximately ten years ago, which was about the same time that the public started to demand accountability from educators. PPBS was, first and foremost, a planning technique whereby the approach to program budgeting was to identify potential activities, estimate their cost, and then relate them to available financing. It was a planning system that extended beyond the familiar budgeting components such as tuition income, capital equipment acquisition, and other procedures of conventional budget planning.

PPBS was not a precise budget matrix as much as it was an approach, a framework for the accounting analysis, and measurement from which the budget itself emerged. College administrators sometimes feared the intent of PPBS because legislators and regulating agencies did not understand that

different programs often required different amounts of expenditures. Administrators feared that they would be locked into a set amount per unit of production regardless of the actual cost necessary to produce the units of production from program to program.

PPBS was characterized by concern for the development of goals, objectives, programs, budget and operational evaluation. The most widespread significance was the identification of true costs of academic programs.

Advantages of the PPBS system included improved allocation of resources, articulation of outcomes between colleges and governmental agencies, establishment of objectives with proper indicators for measurement, and the inherent flexibility of accurate costs for operational expenditures. Critics of the PPBS said that it generated more paperwork and recordkeeping and that it required considerable personnel training.

PPBS certainly impacted curriculum. It allowed for evaluation resulting in a comparison between the goals of the program and the cost per FTEE or unit of production. Because it was a known fact that vocational curriculums were more expensive to offer, it was feared by vocational educators that vocational curriculums would not be expanded in relationship to the actual needs which existed.

The administration of the community college of Philadelphia found that PPBS provided them with substantial understanding of which proposals were the most cost sensitive and which required the closest scrutiny when faculty presented their proposal under the collective bargaining agreement which covered such items as work loads, salaries, and fringe benefits. Union proposals which related to staffing patterns and work loads could be advanced by means of an overnight computer run to access not only the

immediate budgetary impact, but also the impact for three years in the future.

County College of Morse in New Jersey was able to construct unit cost tables that compared on a program by program basis the annual cost per full-time student according to major field of study among the community colleges taking part in the field study done by National Center for Higher Education Management Systems (NCHEMS). The college was then able to show its own trustees that its costs were very much in line and that programs which were expensive at Morse county were equally expensive at other campuses. Had it not been for the new budget data, school officials believed that the trustees probably would have cut the college budget by approximately five percent.

PPBS and other management information systems were not substitutes for administrative judgments. They simply reduced the clutter of information and thus permitted discretion based upon more reliable information.

Chuang (1977) stated that the American taxpayer was very interested in the return for the millions of dollars spent annually on vocational education. It was a fact that the cost of maintaining the quality of vocational education was increasing. The same resources cost more each year, and vocational school administrators were being asked to do a better job under severe financial handicaps.

He maintained that quality education would be easier to attain if budgeting decisions of schools were policy oriented rather than numbers oriented. Vocational programs should be efficient and effective, and alternatives to expensive programs should be considered. Programs should be evaluated periodically, and new programs should be designed to replace

existing programs which have served their purposes. Decisions should be made whether new funds should be utilized for starting more new programs or for improving existing programs.

He stated that zero based budgeting was possibly the tool needed to improve vocational education planning. Zero based budgeting was the tool that management used to assess operations annually from the ground up with every dollar spent having to be justified in terms of current organizational goals. The process was directly related to the need for vocational schools to periodically analyze what they were doing, to set goals and objectives, to regularly evaluate their changing responsibilities and work loads, and to make necessary operational changes. These decisions should be made during the budgeting process as an integral part of it rather than afterwards. It spotted redundancies and duplications of effort among departments and allowed comparisons to be made across organizational lines with respect to funding priorities. It called for a performance audit to determine whether each activity or operation was performed as promised.

Chuang (1977, Pages 24-26) listed the following twelve steps in the zero based budgeting process:

1. Define educational needs.
2. Formulate goals and objectives.
3. Establish objective measurement
4. Identify overall constraints and requirements.
5. Establish general selection criteria.
6. Develop decision packages.
7. Define cost of alternate packages.
8. Define anticipated benefits for each package.
9. Rank the decision packages.
10. Prepare an implementation plan.
11. Manage the resources.
12. Assess results.

Fearn (1968) analyzed the data by questionnaire from North Carolina community colleges and technical institutes which indicated that

respondents thought that curriculum mix was affected by the local administrators budgetary allocations. Budgetary allocations could result in a drift in curriculum away from meeting training needs toward a position more profitable to the local administrator in terms of budgetary considerations.

Educational systems tended to move toward the curriculum mix which was most profitable for the local unit administrator or administrators.

In North Carolina, the various programs differed in variable cost per student and per student contact hour, and the budgetary formulas used full-time equivalent as the base for determining allocations of funds for operating expenses. The entire system moved in the direction predicted by the theoretical model which was toward the average variable cost curricula. This "curriculum drift" applied both to major program areas of college parallel and vocational.

Anderson (1968) summarized the results of a study done by the Office of Surveys and Evaluation of the Virginia Community College System in which the full-time equivalency operating costs were analyzed from the community college systems in eight states.

He concluded that the unit cost of providing the first two years of a curriculum in a liberal arts college was far different from the unit cost in a large comprehensive institution which offered a curriculum in liberal arts as well as specialized courses for vocational and technical curricula. The cost of specialized components of vocational and technical curricula in comprehensive institutions was higher than the liberal arts components because of the small student/staff ratio in shops and laboratories and the greater quantity of facilities and instructional materials utilized per student. On an average, it cost more per student to provide the specialized

vocational and technical curricula than it cost to provide the liberal arts curricula designed for transfer.

The study showed that if it cost $1,000 per student in the liberal arts or transfer programs, it cost about $1,950 per student in the engineering technologies.

Anderson also pointed out that the reliance of community colleges on local sources of funding could lead local boards of control to offer curricula which were lower in cost and which met the needs of the local citizens to a lesser degree. However, he predicted that the increased involvement of the state in providing a greater portion of the funding to operate community colleges would remove this threat in the years to come. As state financing of community colleges becomes greater, there should be less concern on the local level about the extra costs of special curricula because the state would be supporting more of these extra costs.

The Iowa Department of Public Instruction (1978) analyzed the cost of FTEE in Iowa's community college system for FY 1977. The analysis showed that the cost of a FTEE in post-secondary preparatory career education was $1,785.26 without capital outlay for equipment and $1,896.11 with capital outlay.

The study showed that the cost per full-time equivalent unit in the arts and sciences programs had a statewide average of $1,529.82 without including capital outlay and $1,573.69 with capital outlay. Capital outlay included only equipment and did not include facilities.

The study showed that preparatory career programs cost on an average of $255.44 more per full-time equivalent unit than full-time equivalent units generated in the arts and sciences. This meant that on an average it cost 1.167 times as much to operate the average post-secondary career

education program compared to the general arts and sciences program in the community college system in the state of Iowa.

The analysis also showed that it cost on an average of $110.85 for capital outlay per full-time equivalent unit generated in post-secondary career education programs as compared to $43.87 for capital outlay in arts and sciences programs.

The range of costs in post-secondary preparatory career programs ranged from a cost per FTEE of $716.54 to prepare food management production and services trainees to $6,425.78 to train clerk-typists. Although the example here of clerk-typist was an extraordinary situation because it normally does not cost nearly that amount to produce a FTEE in this occupational area, it did show clearly that there is a wide difference in cost between programs.

The analysis showed that the range in the average cost per FTEE within the community colleges in Iowa ranged from a low of $1,287.59 to a high of $1,952.31. A comparison of the range of the cost to produce a FTEE in the arts and sciences to the range of the cost to produce a FTEE in the post-secondary career programs showed that the cost was much more stable in the arts and sciences than in the career programs.

Financial Support Patterns for Community College Systems

Wattenbarger and Starns (1976) completed the third in a series of analytical studies of the financial support patterns of community colleges in the various states. The study was made possible through a grant from the W. K. Kellogg Foundation and was able to be completed through the cooperation and data furnished by the state directors of community and junior colleges in the various states.

The financial support for public community colleges has usually come from five sources which include local taxes, state taxes, federal taxes, gifts and grants, and student tuition. The community colleges, with their local orientation, were often totally supported by local districts until the 1950's when state support became more and more common. However, their report in 1976 showed that the average state general revenue allocation amounted to 59.46 percent as an average in thirty-two state community college budgets.

Wattenbarger and Starns (1976, Pages 11-18) drew the following conclusion with regard to patterns of state funding and identified the following problems as paraphrased below. It was generally accepted that community college education was basically a responsibility of the state and that state patterns of financial support were not adequate to provide adequate funding nor were the funds distributed in the proper fashion to enable the goals of community colleges to be implemented.

The problems which they identified included:

1. Forty-eight of the fifty states provided a combination of state and other funds which generally proved to be inadequate support.
2. Formula dispersion of state support funds was most often based upon student credit hours. States tended to provide these funds on a flat per student credit hour basis even though it had been well documented that some courses cost two or three times as much as other courses.
3. There was often little or no support for community service programs.
4. Funding allocations often encouraged duplication of effort in subjects and program areas.
5. Some states provided support for full-time day students only.
6. Supportive services, such as counseling, were sometimes not accounted for in funding appropriations.

7. There was an almost total lack of funds made available for temporary rental or lease of facilities away from campus for the operation of short-term programs.

8. State policies often limited construction design and implementation which severely curtailed innovative curriculum development.

9. Open-door enrollment policies were often severely curtailed by limitations put upon enrollment.

They analyzed the financial support patterns actually in use in the states over the three year period from 1973-76. Although support patterns varied due to the fact that funding allocation methodologies in each state evolved over a period of time and according to the perceived needs of the state, there were sufficient similarities in existence to identify a simple taxonomy of funding allocation patterns which fit four general models of support which included negotiated budget, unit rate formula, minimum foundation and cost-based program funding.

Wattenbarger and Starns (1976, Pages 15-27) listed the characteristics of each one of the four models as paraphrased below:

Negotiated Budget Funding

1. State funding for individual colleges was either annually or biannually negotiated with the state legislature and/or a state board by college representatives.

2. Each individual college budget was analyzed and approved either as a single entity or by line item.

3. Most states who used this method had no reported formula for budget preparation of funds allocation.

4. None of the states reported revenue from local district taxes to support the operations of their colleges.

5. The states were considered to be in the full state support category which theoretically allowed for complete equalization of educational opportunity.

States which reported negotiated budget funding were Connecticut, Delaware, Idaho, Indiana, Kentucky, Main, Massachusetts, Rhode Island, Utah, Vermont, Virginia, and Colorado.

Negotiated budget funding tended to encourage a high degree of accountability, but it required a large state staff to enforce it. Pressure to regulate both revenue and expenditures threatened local decision-making and responsiveness to local needs. Full state support and negotiated budgeting encouraged state level decision-making.

Unit Rate Formulas

Unit rate funding was a flat grant method of allocating state funds to colleges on the basis of a simple formula specifying a stated number of dollars per unit of measure. The units of measure in the formulas were units of instruction, enrollment, or a combination thereof.

Unit rate formulas included the following characteristics:

1. A minimum local tax effort may or may not have been required.
2. Differences in needs, such as level of instruction, type of college, numbers of students enrolled, and type of instructional program, sometimes became part of the grant computation.
3. Minimum foundation funding and cost-based program funding were considered as advanced developments of the unit rate formulas.
4. Funding did not vary with respect to the local tax paying ability of the district because the amount awarded per unit was uniform statewide.

Some states who used the unit rate formula placed a ceiling on the total funds allocated to a college by stating their allocation in terms of a percentage of college operating expenses. This model allowed for varying funding rates for various program categories which usually resulted in a higher rate of funding for units generated in vocational education programs than in college transfer programs. The most positive aspect of unit rate

funding was local control of budget decisions and expenditures. On the negative side, unit rate funding neither related directly to college responsiveness to local needs nor provided incentives for improvement in programs and services or efficiency. Accountability provisions were absent because funding was not related directly to expenditures or costs other than through set ceilings on state support.

States which reported using unit rate formulas included Maryland, Missouri, New Jersey, New York, Pennsylvania, Alabama, Alaska, Colorado, Kansas, Mississippi, Nebraska, North Dakota, Ohio, Oklahoma, and Oregon.

Minimum Foundation Funding

Minimum foundation funding provided a guaranteed minimum level of support per student through a combination of state and local funds. It was often referred to as equalization funding. Student fees were held constant, and local funds generated through a tax levy determined the state allocation necessary to provide a minimum level of funding. This did not mean that the same number of dollars were available for each unit of output. Richer districts spent more per unit, but it did guarantee a minimum amount available per unit of output.

A major deficiency of this method for financing colleges was the impact of student tuition and fees on equalization of expenditures per FTEE. Only in the cases where student fees were either at zero or uniform statewide, or an assessment of property evaluation was uniform statewide, was equalization approached.

The traditional minimum foundation approach also disregarded recognized factors such as geography and college size which affected directly the differences in financial support needed.

This method did not provide any apparent incentive for promoting efficiency or improving accountability because outputs were not related to expenditures or costs of programs and services.

The states which reported using minimum foundation funding were Arizona, California, Illinois, Michigan, Montana, New Mexico, Wisconsin, and Wyoming.

Cost-Based Program Funding

Cost-based program funding meant that state funds were allocated on the basis of multiple cost centers, detailed instructional discipline categories, program functions, and/or budgeted line item of expenditure. Allocations were usually made based on extensive cost studies at the state level. This funding concept was based on funding related to actual cost and the cost varied due to program and other institutional factors.

Cost-based program funding had high potential for equal opportunity provisions when costs were accurately assessed on a statewide basis and were fully funded.

Accountability was a built-in feature of this method when cost comparison was an integral part of the process.

State level incentives to improve programs and services were possible through this method.

There was a danger that funding based on statewide average cost would discourage efficiency since lower costs resulted in subsequent lower funding levels. Responsiveness to local needs and local control of decisions with respect to program direction and budget could fall prey to state level intervention.

The states which reported using the cost-based program funding model included Arkansas, Florida, Georgia, Hawaii, Iowa, Louisiana,

Minnesota, Nevada, Tennessee, Washington, West Virginia, North Carolina, Oklahoma, South Carolina, and Texas.

Garms (1977) developed nine criteria to evaluate state funding models to determine how adequate the funding models meet the needs of community colleges.

Garms (1977, Pages 38-40) listed the nine criteria as paraphrased below. The finance program should:

1. enhance, rather than impede, the ability of the community college to serve those who find access to traditional institutions difficult.

2. enhance the ability of the community colleges to provide courses and programs not provided or insufficiently provided by other institutions.

3. enhance the ability of the community college to respond to the particular needs of the community it serves.

4. help to preserve the health and independence of the private section of higher education.

5. help to keep the expansion of the community colleges within the bounds of public willingness to support them and should take into account the financial health of the state and local governments and the competing demands upon them for money.

6. help to prevent wasteful duplication among institutions and among the levels of education including secondary, community colleges, area vocational schools, liberal arts colleges, universities, and specialized technical schools.

7. encourage the various colleges to operate their own programs efficiently.

8. provide equity to the students of the colleges.

9. provide equity to the taxpayers who support it.

He was not attempting to say whether or not community colleges were worth financing. Other studies have determined that education yields greater returns to the individual and to society than investing the same amount in the typical alternative investment such as stocks. However, the

rate of return generally decreased from elementary to graduate education.

Money was the common denominator of economics because it had no intrinsic value, but was used to purchase a wide variety of things that were of materialistic value. Money was used for purchases that were thought of as either consumption or investment and education had both consumption and investment aspects.

He categorized the methods of financing community colleges into three groups: market economy, planned economy, and mixed models.

The economy in the United States had been predominantly a free market economy in which there was very little concern about duplication of effort and very little central control over what was to be produced. In the free market economy, the profit motive determined how much and what was produced.

However, the western world has felt that some things were better off financed and controlled by the government including national defense, highways, parks, libraries, and museums. Economists haven't necessarily put education in with these items which they considered good to be under the control of government. Using the premises of the free market economist, public subsidization and control of education wasn't necessary or desirable.

However, in the United States we have not had a market economy educational system. We have had a planned economy educational system which was planned centrally with government dictating what was produced, the quantity and the quality to be produced, where it was to be distributed, and the price at which it was to be sold. The advantage of a planned economy was elimination of wasteful duplication of effort while the faults included lack of individual choice and lack of efficiency.

All public education systems in America have operated under the planned economy model with varying degrees of control.

He described two systems of financing community colleges within the planned economy model. The first system was state financing with centralized control which described the community college system completely controlled by the state. There was no local financial contribution and the administration of each college was responsible to a central state board. Educational goals for the system were centrally decided with respect to size of enrollment and curricula. A detailed budget for each college was approved centrally by the board and by the legislature on a line item basis. Each individual college was a branch campus of a centrally controlled statewide community college system. Students were assigned to any campus within the system. Tuition was neither necessary nor prescribed. States listed as having a centralized system included Alaska, Colorado, Georgia, Iowa, Kentucky, Massachusetts, Montana, Oklahoma, Utah, Virginia, Rhode Island, and Puerto Rico.

The second finance model which he discussed was state financing with some decentralization of control. This model also requested little or no local financial contribution to community colleges, but it allowed individual colleges to have some say in how they spent their money. With a substantial reduction in the central governments role in budgetary approval, a mechanism had to be used for distributing state money which was usually in the form of a formula. Formulas were used to allocate instructional personnel based on teacher-student ratios: janitorial services were based on the number of square feet of building space, instructional materials were allowed on the basis of a certain number of

dollars per unit of production generated. Another example was in the state of Florida where all programs were placed into one of four expense categories ranging from business and liberal arts courses to certain vocational courses that were more expensive.

The states that appeared to have systems that fit into the decentralized model included Connecticut, Florida, North Carolina, South Carolina, Tennessee, and Washington.

The main differences between the two models were that the decentralized model fostered some innovation and increased the ability of the college to respond to the needs of the community. Disadvantages of the decentralized system were that the demands of the system upon the state treasury were less definite and the possibility of wasteful duplication was greater.

Within the decentralized system, there were two types of formula approaches. The detailed system used in North Carolina provided a formula for practically every line item in the budget in an attempt to provide an objective formula that met the needs of the individual colleges. It was based on the assumption that each of the formulas was accurately related to the cost of the service to which it related. However, the more formulas there were, the less likely it was that they would be closely scrutinized at frequent intervals to see that this was so. Budgeting by formula on a line item basis implied a spurious accuracy that often resulted in inequitable allocations and in manipulation of accounts by the college.

The type of formula budgeting typified by Florida's method represented a distinct improvement on the line item formulas but still had some drawbacks. The idea was to classify programs into a limited number of cost

categories determined from accurate cost studies. The advantages to this type of formula budgeting were that it avoided the rigidities and accuracy of the line item approach; that it was easier for both the state and each college to estimate in advance the amount of the allocations; and that it provided flexibility in the use of the allocations by the college. Disadvantages included difficulty with classifying FTEE by program and a strong tendency to design low cost courses that could be classified into high cost categories which could be required of all students in certain programs. The result was that some courses or programs were badly overfunded or underfunded. The number of program cost categories should probably range from five to ten to provide a reasonable number of categories without making the system unwieldy.

It appeared that the formula budgeting approach, using program cost classifications, was a better approach than the line item formula budgeting approach.

Since neither the market economy model or the planned economy model existed in its pure form in the United States, several mixed models which represented a kind of middle ground between the extremes were discussed. Characteristics of the mixed model included the following:

1. All of them represented a financial partnership between the state government and local government.
2. All systems fitting these models were public institutions.
3. State and local partnership enhanced the influence of the local community in the determination of programs that met the needs of the local community.

Garms (1977, Pages 62-71) discussed the characteristics of four mixed models which were paraphrased below.

Percentage Matching

In the percentage matching model, the community college developed its own budget and the state agreed to provide a percentage of that budget with the remainder being made up from other sources such as tuition and local taxation. The intent of the percentage matching method was to encourage community colleges to provide services which were needed in their localities without interference from the state. The state merely agreed to pay part of the cost.

Five of the 36 states in the sample were percentage matching in form and included Maryland, Missouri, New Jersey, New York, and Pennsylvania.

The disadvantages of the percentage matching model were that:

1. most states were forced to set a maximum on the states participation.
2. those who found traditional institutions difficult to access were negatively affected by percentage matching because those areas which contained the largest proportion of such students tended to be the poor areas. They raised less money locally, got less from the state, and were unable to offer the variety or quality of programs offered by colleges in the wealthy areas.
3. there was difficulty in keeping the expenditures for the community colleges within the bounds of the states' ability and willingness to support them.
4. it did not promote interinstitutional efficiency and tended to promote program duplication.
5. it failed to provide equity to the student and to the taxpayer.

The advantages to the model were that:

1. it provided programs otherwise not provided.
2. it responded to community needs.

Flat Grant

The flat grant model was the second mixed model he discussed and was based on the state giving each college a grant based on a set number of

dollars per unit of measure. Each college raised the rest of its budget through local taxation, tuition, or by other means. Ideally, the state would set no limitations on the expansion of units of production in the colleges, on the tuition rate, or on the maximum local tax rate. Most of the control rested with the local college and its locally elected or appointed board. Varying rates of reimbursement were provided to different academic areas depending upon the cost to offer them.

The flat grant model was another way in which states attempted to give community colleges money without dictating the content of their programs. The flat grant model met the finance program criteria listed by Garms in the following manner.

1. It did a fair job of serving those to whom access was difficult because it allowed for at least a minimum program to all on an equal basis.
2. It did a rather poor job of providing for programs which were not otherwise provided.
3. It did a relatively poor job in responding to community needs.
4. It posed little danger to the state treasury because of extraordinary growth and still left the institution free to expand its enrollment without state permission and to qualify for more state aid.
5. There was no mechanism to prevent wasteful duplication of offerings.
6. There was some incentive toward intra-institutional efficiency.
7. It tended to equalize educational opportunity and to provide equity to the taxpayer.

Nine states out of the sample of 36 had a flat grant formula including Colorado, Kansas, Mississippi, New Mexico, North Dakota, Oregon, Texas, and Wisconsin.

Six other states had formulas that were like another model, but

because the limitations imposed by the state were artificially low, the theoretical model operated so that most colleges got a maximum or minimum grant expressed in terms of a set number of dollars per FTEE. They were, in affect, flat grant systems. Those states included Illinois, Maryland, Michigan, Missouri, New Jersey, and New York.

Foundation Program

The foundation program consisted of state and local sharing of current educational costs that emphasized decreasing the differences in a community's fiscal ability to support a community college. The state established a certain number of dollars per full-time equivalent student which represented the amount or foundation necessary for an adequate community college program. Flexibility was allowed for different programs. The state specified a minimum local tax effort and tuition rate that had to be maintained. The amount of the budget guaranteed by the state was equal to the foundation amount per unit of production times the units produced by the college. From this was deducted the amount raised by the required local tax rate and the income from tuition. The remainder was supplied by the state. There were four states whose state aid program was foundation in form, including California, Illinois, Michigan, and Wyoming. Although Iowa was not categorized into the foundation program model by the author, the funding model used in the state of Iowa had almost all of the characteristics of the foundation program.

The foundation model met the criterion listed by Garms in the following way:

1. It tended to make access for students easy because the amount of aid uniformly provided tended to be higher than in the other models.

2. It tended not to provide programs otherwise provided because it suffered from the use of full-time equivalent students as a measure of need and inhibited the offering of innovative programs of which costs were not reflected in the full-time equivalents they generated.

3. It responded well to community needs because the foundation program implied the opportunity for each college to offer what its community needed without being shackled by its poverty.

4. Because of the uniform aid, it tended to nudge the colleges toward uniformity.

5. There was a strong incentive to increase the number of full-time equivalent students which tended to put a strain on the legislature for increased appropriation.

6. The foundation model did little to prevent wasteful duplication among institutions.

7. Local control was a feature of the model.

8. It encouraged intra-institutional efficiency.

9. If no college was allowed to raise additional money above the required amount through local taxes, the foundation program equalized the opportunities for students.

10. It tended to put pressure on the state treasury which caused states to set the foundation guarantee unrealistically low. This left the richest college districts raising the most money through the required tax and tuition even though their state aid was less than the poorer colleges received with state aid.

Wattenbarger and Starns (1976) stated that cost-based program funding had high potential for equal opportunity when costs were accurately accessed on a statewide basis and were fully funded. Fair treatment and equitability were enhanced for the student, the taxpaying public, and the colleges. Accountability was a built-in feature of this method when cost analyses were an integral part of the process.

Wattenbarger and Starns (1976, Page 60) defined the cost factors applicable for differentiation of funding of programs which were paraphrased as listed below:

1. Number of students enrolled.
2. Geographical location of campuses.
3. College status of development in terms of campus and curriculum.
4. Type of curricular program and/or distribution of instructional discipline enrollments.
5. College program functions.

They discovered that sixteen states were using a cost-based budgeting procedure in the distribution of state aid which was appropriated for community colleges.

The Iowa Department of Public Instruction (1968, Page 50), in its study to determine the feasibility of a statewide community college system, recognized that different curriculum offerings required varying amounts of financial support with the following statement: "quality education in all areas, especially in occupation-centered curriculums, requires a high level of financial support."

The Florida Department of Education (1978) issued a full cost summary report for fiscal 1977 of the Florida Community College system. The community college system in Florida was managed centrally. The state of Florida awarded grants to community colleges based upon the average cost of instruction in each of 34 disciplines. The 34 disciplines were divided into four categories and included the following:

Category 1: Advanced and professional

1. agricultural and natural resources
2. architecture and environmental
3. area studies
4. biological sciences
5. business and management
6. communications
7. computer information and science
8. education
9. engineering
10. fine and applied arts
11. foreign languages
12. health professions
13. home economics

14. law
15. letters
16. library science
17. mathematics
18. military science
19. physical science
20. psychology
21. public affairs
22. social sciences
23. interdisciplinary studies

Category 2: Occupational

1. agriculture
2. distributive
3. health
4. home economics
5. office
6. trade and industrial
7. technical

Category 3: Developmental

1. compensatory
2. adult, elementary, and secondary

Category 4: Community Instructional Services

1. citizenship
2. avocational

The enrollment mix that each college had was used to calculate total financial need, and the amount of state aid was set at the level of total need less tuition, federal revenues, and other financial resources. Adjustments for future expenditures were made for inflation based upon a weighted average of the wholesale price index and the consumer price index.

The Florida Department of Education (1978) described their cost analysis procedure as a system designed to show the cost of providing instruction for each individual course and for various levels of course aggregations. All courses and their associated costs were included in the analysis regardless of the source of revenues which supported them. The system identified the components of cost according to two basic parameters:

1. the type of expenditure.
2. the purpose of the expenditure.

The information developed by this system was used for the following purposes:

1. to aid college administrators in making resource allocations and program decisions.

2. to conduct comparative cost studies.

3. to develop and support requests for fu... ...om the state legislature.

4. to allocate funds to individual colleges.

5. to make long-range cost projections.

The general principles of this cost analysis procedure included the following:

1. Expenditures included in the analysis were those recorded in the general fund and the restricted current fund and included expenditures for furniture and equipment, library books, films, and plant fund.

2. The analysis included all courses which began in the academic year.

3. The unit of measurement of production was the semester credit hour and the semester credit hour equivalent for non-credit courses. The credit hour equivalent was computed by dividing the total number of instructional hours in non-credit courses by 27. Semester credit and equivalency were converted to annualized full-time equivalent units by dividing the total number by 30.

4. There were two basic formats for developing and displaying cost data. The first format was direct costs which were those associated with conducting activities classified according to the principles and definitions in the community college information classification structure. A second cost category was full costs, which were those related to producing a specific quantity of output. In this analysis, full costing was accomplished for instructional programs only. The assumption was that instruction was the production function of the Florida community colleges. Support costs were allocated to instructional cost centers based on charge back procedures or semester credit ratios.

5. The cost components for each cost center included:

    a. personnel expenditures for instructional, executive, administrative and managerial, professional and support.

    b. supplies and services expenditures.

    c. equipment.

Distribution of the expenses in each of the above three categories was by formula and were directly related to the exact cost of input by course.

The Illinois State Board of Higher Education (1975, Pages 1-6) made the following recommendations regarding a state funding plan for the Illinois public community colleges which were paraphrased as follows:

All instructional programs which generated credit hours were divided into the following eight categories:

1. Baccalaureate
2. Business, public service, and personal services
3. Data processing and technologies
4. Natural science and industrial technologies
5. Health professions
6. Review of vocational skills
7. Remedial-developmental general studies
8. Other general studies
9. Community education, public service and research

Financial resources were provided for all categories. For every credit hour in instructional categories one through eight, the state made flat grants per credit hour for a certain percentage of the difference between (1) the statewide average cost in the system for that category, as adjusted for inflation, marginal cost savings, and productivity savings,

and (2) the standard local contribution calculated from statewide average property taxes, tuition and fees, and other local revenues.

The eighth and ninth categories were more locally oriented so the state would fund higher percentages for the first seven categories. Specifically, it was recommended that the state would fund 100 percent of the difference between the statewide average cost and the standard local contribution in the first seven categories, and only 50 percent of the difference for the eighth category and zero percent of the difference for the ninth category.

Equalization grants were provided for districts unable to raise the portion of the standard local contribution funded by property taxes using the statewide median tax rate. This method of equalization was built into the basic flat grant funding approach rather than added on externally in an unrelated manner. Grants for the educationally disadvantaged student were provided to all districts for a portion of the added costs of such education.

Other policies which were recommended included: that state and federal vocational education grants distributed through state agencies should be counted as a part of the state support for community college operations; that local control of the community colleges should be preserved; that the Illinois Community College Board should continue to review all programs and courses to determine if all were appropriately categorized; that the Illinois Community College Board and the Illinois Board of Higher Education should develop procedures for an annual review of existing programs; that local districts should be permitted to levy a 17½¢ per hundred dollar assessed valuation educational fund tax rate and a 5¢ per hundred dollar assessed valuation building and maintenance fund

tax rate with provision for a referendum; that tuition and fees should be determined by local districts up to the maximum permitted by law which was 1/3 of the instructional cost; that state and local contribution to community college operations should be considered as state aid to students and not as aid to college operations; that state contributions to the state university retirement system should be considered as state aid to college operations; and that enrollments for funding purposes should be counted at midterm with each local institution being able to receive earlier payments based upon projected enrollments.

The Texas Education Agency (1978) used the contact hour as a basis for the distribution of state aid. The fall preceding the legislative biennium became the base year for calculating the contact hour cost.

Programs were categorized into vocational-technical programs and general academic programs. The median overhead cost per contact hour was calculated for each of the two categories and that was the amount that each institution included in its budget projection for overhead.

The median direct cost for each of the two categories was also computed for each program. Each school then prepared a projected budget with expenditures calculated by multiplying the number of contact hours for the base year by program times the median overhead rate and the median direct cost rate.

The state general aid request became the amount of the total expenditures from all the colleges minus the amount generated from local tuition and federal support. The overall state aid average in 1978 was 65 percent and all other sources equaled 35 percent.

In addition, by law, the local district levied a sufficient amount of local taxation to build and maintain physical plants.

A minimum tuition rate of $25 per student which covered the first six semester hours plus $4 per semester hour for those hours over six was charged.

The Illinois State Board of Higher Education (1975) stated that in California the average daily attendance was the unit of measurement used to fund community colleges. An average daily attendance unit was defined as 15 contact hours per week. The count of students for funding was taken on the tenth day after registration with the count adjusted later for attrition.

Local voters in California elected a level of expenditures per student and not a tax rate for community colleges. A basic level of funding was provided for each average daily attendance in every community college. If the aid plus tuition and local tax revenues was insufficient to provide a foundation level of support per average daily attendance enrollment, additional state aid was provided up to that foundation level. This level of expenditures could increase six percent each year without a new vote of the electorate. Therefore, local expenditures per student increased and decreased with enrollment and was allowed to grow with inflation at the rate of six percent a year without a new vote of the people. Local taxes increased if enrollment and/or inflation to the extent of six percent grew faster than the assessed valuation of property in the district.

History of Iowa Community College Funding Methodology

Moench (1977) traced the funding history and methodologies in Iowa's area community colleges. Senate File 550, which established Iowa's community colleges in 1965, intended them to be financed from a

combination of sources which included a local 3/4 mill tax on all real estate for constructing facilities and buying equipment, a second 3/4 mill tax for general operations, tuition and fees, state general aid, federal aid, and miscellaneous aid.

Since 1966, when Iowa's community college system became a reality, six formula methodologies have been designed and used to distribute state general aid to each of the area colleges.

The funding formula during the period from 1966-69 was set forth by Chapter 286A, Code of Iowa. Existing junior colleges were reimbursed at the rate of $1.00 per day times average daily enrollment of resident students and $2.25 per day times average daily enrollment of nonresident students times the number of days in session up to 180 days. A full-time student was defined as one who carried 12 or more semester hours.

The newly formed merged area schools were also reimbursed at the rate of $2.25 per day times average daily enrollment of resident students times the number of days in session up to 180 days. A full-time student was one who carried 12 or more semester hours. Full-time equivalents were computed for part-time students in both the junior colleges and area schools.

Reimbursement was made on a quarterly basis with an adjustment in the fourth quarter based on actual FTEE served. Guidelines for reimbursement and the request for appropriations to the state legislature were based on estimated FTEE to be served.

The funding formula used during the period from 1969-71 resulted from dissatisfaction with the old one. The appropriations had not been sufficient to fully fund the area schools under the old formula, so an

effort was made to provide for growth in FTEE for all area schools as well as to provide an additional growth factor for eight area schools which were still identified as developing institutions. The appropriations request was based on full reimbursement of a projected growth of FTEE in existing programs and initiation of new vocational programs. Appropriations recommended by the governor to the legislature were considerably less than the initial request. In an effort to maintain the full reimbursement of $2.25 per day per FTEE and to provide for growth in both the first and second year, a new funding formula was initiated. In summary, the following procedures were followed:

1. The governor's recommendation of 9.7 million each was changed to nine million the first year and 10.4 million the second year. This provided the flexibility to grow the second year. Projected full reimbursement per FTEE ($500) established the maximum number of FTEE that could be reimbursed each year.

2. A base FTEE figure and allocation were established for each area school.

3. This left a limited number of FTEE to be allocated to all schools. This was done in the following manner:

    a. Eight schools were identified as developing institutions based on the percentage of population not being served. These schools were allowed a five percent growth factor based on the FY 1979 FTEE.

    b. The remaining FTEE were allocated to all 15 schools based on their percent of total state population.

Under this funding formula, each area school was guaranteed an allocation of FTEE at full reimbursement. The appropriation bill was written as a line item allocation to each area school which eliminated any opportunity to adjust the reimbursement to actual FTEE served.

The funding formula used during the period from 1971-73 was also recommended on a line item basis for each of the 15 schools in a

manner similar to that followed by the 64th General Assembly in 1969 when House File 825 was enacted to provide $9,000,000 for 1969-70 and $10,400,000 for 1970-71. This appropriation provided $12,170,000 for 1972-72, and $13,800,000 for 1972-73.

The line item amounts were determined in 1969 on the basis of projected enrollments only. However, the line item amounts in this bill were based on the latest available actual enrollment figures coupled with a direct comparison of actual enrollments in the fall quarter of 1969 and the fall quarter of 1970. This comparison provided a direct correlation of actual enrollment with anticipated enrollment during the next two years.

The formula used in determining these line item amounts was developed over a period of many months by the Iowa Council of Area School Boards, Area School Superintendents, and the Area Schools Division of the Department of Public Instruction. All 15 area school boards had approved the formula which was used in the line item amounts contained in this bill.

The formula was developed from information supplied by each area school to the Department of Public Instruction regarding projected costs of continuing present programs and establishing needed new programs to provide skill-training to meet the needs in each merged area school. $34,000,000 in general aid would have been required to meet these needs.

When it became necessary to adjust the $34,000,000 to fit the funds available, the formula was used to reduce the line item amounts for each area school in a fair and equitable manner. Adjusting a $34,000,000 need to fit the $25,970,000 of available funds which were provided in the governor's budget required the elimination of most new programs, the curtailment of some present programs, and continued improvement in the

economy and efficiency of operation in each area school. The line item amounts were determined by the following methods:

1. A base was established for each school equal to the 1970-71 line item amount (some schools were given an adjusted base increase because they exceeded the projected enrollment during the 1969-70 year). They required $10,742,022 to provide the base and make adjustments.

2. The formula developed for the distribution of $34,000,000 provided percentage figures for each area school. These percentages were applied to the difference obtained by subtracting $10,742,022 from $12,170,000 for the first year of the biennium and adding these amounts to the adjusted base for each school. A similar procedure was followed to determine the line item amounts for the second year of the biennium. The formula involved a:

   a. base.

   b. comparison of proper evaluation behind each student and an adjustment for area schools below the average.

   c. comparison of tuition charged and adjustment for area schools below the average.

   d. comparison of enrollment (fall quarter of 1969 and fall quarter of 1970).

   e. comparison of percentage of population being served.

Use of the five factor formula provided more equity in the distribution of the available funds than would have been possible by using only one factor of projected enrollment.

The actual formula for determining line item amounts for each area school was quoted from Moench (1977, Pages 9-10). "A = adjusted base, X = amount appropriated, F1 = percent factor for 1972, F2 = percent factor for 1973, D = difference between adjusted base and amount appropriated, AD1 = adjusted amount above base for 1972, AD2 = adjusted amount above base for 1973.

Fiscal year 1972	Fiscal year 1973
X - A = D	X - A = D
D x F1 = AD1	D x F2 = AD2
A + AD1 = line item 1972	A + AD2 = line item 1973"

The approach to the appropriations request for the 1973-75 biennium again was a cooperative approach between the area schools and the Department of Public Instruction. The approach eventually agreed upon provided for support to maintain the ongoing general fund operation and a request to replace instructional equipment that was either worn out or obsolete. In addition, a separate appropriation request was developed for the support of new programs. This latter request was deemed important since it would enable the legislature to clearly see the amount of funds area schools were requesting to start new programs or additional sections of existing programs.

The base appropriation requested for maintaining ongoing programs recognized a need for increased funds to meet spiraling inflationary pressures on the cost of living, materials, supplies, transportation, and utilities. Each area school was allowed to increase its expenditures by six percent for all educational functions except those programs fully funded from outside sources for the 1973-74 and 1974-75 school years.

The proposed expenditures that were increased by six percent for each year of the biennium were then reduced by the amount of projected revenue available from tuition, the 3/4 mill property tax levy, state and federal vocational reimbursement, and other revenue sources including federal funds. A determination of revenue for tuition was based on an effort to establish a uniform tuition charge of $400 for two semesters or three quarters during the biennium. The difference between the proposed expenditures and the projected income became the amount requested for state general aid.

In addition, a separate request was made for equipment replacement that was equal to four and one-half percent of the total equipment inventory of all area schools as determined by the state auditor's office.

Although the line item appropriation eventually approved by the legislature did not include the exact amounts as requested by this formula, it did not provide generally for the amounts required to meet ongoing program needs and did provide $200,000 for each year of the biennium for equipment replacement. The department, in allocating the increased vocational reimbursement funds appropriated, determined that a significant portion of this appropriation would go toward the creation of new preparatory career programs. This determination by the department resulted in the development of 63 new preparatory career programs during the fiscal year 1974 and five additional programs during 1975. In addition, each of the area schools received additional allocations to strengthen supplementary career programs for employed adults.

The second regular session of the 65th General Assembly recognized the impact of inflation on the purchasing power of the dollar and appropriated $2,535,000 for salary adjustments for area school employees. This appropriation was intended to provide area schools with an overall seven and one-half percent increase in salaries, but the actual determination of how the funds were to be allocated was left to the discretion of the Board of Directors of each area school. This salary adjustment was included in the state general aid amount for fiscal year 1975.

Preparation for an appropriation request for the 1975-77 biennium was greatly influenced by the availability of additional financial information which provided more accurate costs relating to both program

expenditures and FTEE expenditures. These costs and related information were carefully reviewed and a new concept for funding area schools was developed utilizing the average cost per FTEE in area schools.

The final state general aid formula was developed through a formula that was based on four cost centers: adult, college parallel, vocational, and agricultural production for veterans. The average statewide cost for each of these cost centers was calculated for fiscal year 1974, the last year for which figures were available. Each cost center was then multiplied by the number of full-time equivalent students in each area school enrolled in this cost center for fiscal year 1974. This base enrollment cost was then projected forward for fiscal years 1976 and 1977 by increasing the cost of each center by eight percent with the exception that the vocational cost center was increased by 10½ percent to better reflect the spiraling costs of inflation affecting materials and utility costs. This projection then provided the anticipated expenditure to maintain the currently operating programs for the new biennium with the exception of federally funded programs which were excluded since they were fully funded from outside sources.

To determine the state general aid required, sources of revenue were subtracted from the anticipated expenditures. These sources of revenue were determined by:

1. computing the tuition income based on the average tuition of all area school students for fiscal year 1974 multiplied by the FTEE for each area school.
2. including one-half of the projected income from the local tax levy for each area school (the remaining one-half was excluded to provide area schools with flexibility to meet anticipated needs and matching fund requirements).
3. projecting income from sales and services.
4. identifying the projected federal and state vocational aid.

These revenue sources for each area school were then subtracted from the anticipated expenditures for each area school for the two years of the biennium.

After subtracting the major sources of revenue from projected expenditures for each year of the biennium, this figure for each area school was then adjusted by adding to it the salary adjustment appropriated by the general assembly for fiscal year 1975, a campus adjustment of $25,000 for a second major campus, and an additional $15,000 for those area schools operating a third major campus. The sum of these amounts was the state general aid request for the 1975-77 biennium.

The funding approach to the 1975-77 biennium represented a major change from previous approaches since it was based on actual cost per FTEE. Procedures utilized in arriving at these average costs were readily available for public scrutiny, and the formula received a rather positive acceptance as far as the concept of the formula. Actual appropriations, however, were considerably less than requested and turned out to be $25,800,000 of general state aid for the fiscal year 1976 rather than $30,258,126, and $29,800,000 of state general aid for fiscal year 1977 rather than $39,299,651. Vocational and equipment replacement requests were also reduced from the amounts requested. Vocational aid of $7,987,200 in fiscal year 1976 and $8,285,900 in fiscal year 1977 was appropriated. The equipment replacement funds increased substantially to $1,201,000 in fiscal year 1976 and to $1,350,000 in fiscal year 1977. No appropriations were made for increased program enrollments and new career programs.

An additional appropriation was made of $787,500 for payment of the

increased cost of employer's contributions to the Iowa Public Employees Retirement System (IPERS). This appropriation was to be paid at the conclusion of the fiscal year 1977 to each merged area school based on the actual increases and contributions to the retirement system. This amount was insufficient to pay claims in full and had to be prorated at 85.79 percent.

One of the greatest impacts on area schools of the formula approach was the increased focus on program FTEE costs. The formula recognized average FTEE costs and, as a result, had the effect of penalizing area schools that had higher than average costs. The implications of this impact were debated at considerable length. Some argued that this approach was necessary to encourage economy of operation. Others protested that it was unfair to area schools that generally served more rural areas with lower concentrations of population and that it would have the tendency to encourage institutions to start relatively inexpensive programs rather than programs that had a higher priority and also a higher program cost.

The funding formula for 1977-79 was further refined to take into account the need for new cost centers. The number of cost centers was expanded to the following eleven major cost centers: adult basic education, high school completion, supplementary career programs, continuing and general education, drinking drivers course, short-term preparatory career programs, full-time preparatory career programs, high school joint effort programs, agricultural production for veterans, special needs, and college parallel.

Two of the major cost centers were further subdivided to provide additional cost centers. The full-time preparatory career program center

was divided into 123 cost centers which allowed one for each preparatory career program, and the special needs center was divided into two cost centers which allowed one for programs and one for projects.

FTEE costs for each cost center were developed and excluded capital outlay expenditures. These cost centers were divided between direct costs and indirect costs for each cost center.

Each cost center was adjusted forward for both direct and indirect cost by inflationary factor of 7.3 percent per year. This percentage was the initial cost of living increase projected for the elementary and secondary foundation formula. The percentage was later adjusted to 7.8 percent.

A significant change in the procedure for applying vocational reimbursement was also included in the formula. The reimbursement procedure for preparatory career programs was uniformly changed to an excess cost factor. This factor was determined by computing for each preparatory career cost center, the amount, if any, that each was above the average FTEE cost for college parallel programs. These amounts were then added together for each merged area school to arrive at the amount of vocational reimbursement to be paid as an excess cost factor to preparatory career programs. No excess cost vocational reimbursement was included in the formula for 87 preparatory career programs whose cost did not exceed the average cost for college parallel programs.

In determining income sources for the funding formula, several changes were made. These changes were:

1. The inclusion of actual tuition and fees for fiscal year 1976 increased by ten percent (excluding, however, tuition and fees for students not eligible to receive state general aid since the FTEE and associated direct program costs for these students were excluded from the formula).

2. A commitment factor for vocational reimbursement that was initially included in the formula at 15 percent of preparatory career program costs, but was later reduced rather significantly to approximately four percent.

3. A projection of income for federal workstudy assistance to student employees.

Income sources were again subtracted from projections of anticipated expenditures based on fiscal year 1976 FTEE, increased by the inflationary factor of 7.3 percent. The difference between projected expenditures and income sources was the basis for the state general aid and vocational aid appropriations which allowed for the change in vocational aid based on the factor of excess costs and preparatory career programs. Two additional adjustments were then added to the formula to determine the need for state appropriations. These adjustments were the campus adjustment as in the previous biennium and a seven percent minimum support level. The latter adjustment was an effort to guarantee that each merged area school would receive no less than seven percent more state general aid and state vocational aid than in the previous fiscal year. Total appropriations eventually approved by the general assembly were sufficient to meet only 97.73 percent of the state general and vocational aid required by the formula.

For fiscal year 1978, appropriations for merged area school general fund expenditures were $32,714,100, $8,285,900 for state vocational aid, and $1,350,000 for equipment replacement.

Area schools projected $81,847,282 of expenditures for fiscal year 1978. The amount of the expenditures proposed were spread among the eight functions contained in the accounting system, including the four direct functions of adult education, career education, college parallel, and activities related to instruction as well as the remaining four indirect

functions of administration, student services, learning resources, and physical plant. The same breakout of multiple cost centers as were identified for the last biennium were maintained during fiscal year 1978.

Units of Measurement

Wattenbarger and Starns (1976) showed that there was no universal definition among community colleges in the various states for student credit hours, full-time students, part-time students or formulas for computing student full-time equivalency (See Appendix E).

They recommended that the measure for instruction be the contact hour. The contact hour of instruction represented teacher and students in an instructional process for a period of time.

The credit hour, as a unit of measure, was computed from the number of contact hours of instruction and was used as an alternate measure of instructional service. When the credit hour is used in a formula, it should have a clearly defined credit hour equivalent for non-credit instruction which does not penalize the funding for non-credit courses.

The student FTEE and the faculty full-time equivalent were not considered to be direct measures of instructional productivity, and, therefore, were not recommended.

Legislative Trends in Community College Legislation

Martorana and Smutz (1978) reported that Federal Vocational Education Legislation and Regulations were having an impact on community and junior colleges. In their study of legislative trends regarding community college legislation, they reported that twelve states including Delaware, Illinois, Iowa, Minnesota, Missouri, New Jersey, New York, North

Carolina, Oklahoma, Utah, Washington, and Wisconsin, felt that the impact was taking the form of changes in the budgetary process, the amount of funding, the administration of programs, size and composition of advisory committees, and the amount of authority State Vocational Boards may delegate.

The Vocational Education Amendments of 1976 resulted in greater access to Vocational Educational Funds for the Disadvantaged and Handicapped and placed a great deal of emphasis on program evaluation. The resources required to provide for these two additional aspects of vocational education threatened some programs because of the lack of adequate funding which was needed for serving the new disadvantaged population and for meeting the administrative needs required to account for student placement records and upgrading programs. Nationally, Federal Appropriations to Vocational Education supported only five percent of the total appropriation for vocational education. With the new restrictions and demands put upon community colleges in order to remain eligible for federal money, some were asking whether or not the Federal Appropriation was worth all the trouble.

Federal legislation was not only impacting on curriculum through budgetary procedures, but also through direct legislation affecting academic programs. In 1977, 60 pieces of legislation were reported that affected academic programs, of which 30 were enacted and 30 proposed.

Forty-six bills, of which 26 were enacted and 20 were proposed, affected post-secondary education curriculum matters. The main intent of these bills, whether passed or proposed, was to require state level boards to institute statewide program reviews to identify duplicative efforts to insure quality, and to approve or disapprove new programs.

Fountain and Clampitt (1977) conducted a postcard survey among the State Directors of Community and Junior Colleges who attended the National Council of State Directors at the workshop in Orlando. The purpose was to determine the trends on three basic issues relating to funding. Of the 39 respondents to the survey, 53.8 percent indicated that there was a trend for legislatures and state-level boards to dictate that the funds for community colleges be spent in the line items for which they were requested and appropriated; 53.8 percent indicated that the formula budgeting approach had a significant impact on the total dollars received; and 46.2 percent indicated that there were pressures within their states which forced institutions to spend funds in the areas of instruction in which they were generated.

Martorana, Wattenbarger, and Smutz (1978) stated that as changes in the funding and decision-making realms occur, the ability of community colleges to remain adaptable and flexible to meet their multiple goals must be reexamined. They predicted that community colleges were clearly entering a period of financial stringency as a result of decreased state appropriation growth rates, restrictions on institutional growth, and increased outside control over expenditures.

Until the late 1950's, local communities provided almost all community and junior college funding. Since that time, states have increasingly assumed a major share of the funding responsibility as the number of community and junior colleges rapidly grew throughout the country. As a result of this shift toward state level funding, the states often enhanced their control over local community colleges.

State legislatures have been quite active in the realm of community college financing during the past five years. Of the bills dealing with

community college education, 123 of the 354 bills introduced from 1973 to 1975 dealt with finances. Seventy-six of the 237 bills in 1976 and 154 of the 545 bills in [illegible] dealt with community college finance. The level of state support has become a crucial legislative issue for community and junior colleges. It has become especially crucial for those making policies affecting the individual institutions.

Generally, state legislatures increased dollar appropriations in most states each year. Nevertheless, the trend has been for the average percentage growth rate in appropriations to decrease. The average percentage increase was 20.1 percent in 1974-75, 21.9 percent in 1975-76, 18 percent in 1976-77, and only 12.1 percent in 1977-78. This decrease in the average percentage growth rate meant that community college systems were not expanding and that they were hard pressed to maintain current services since increased costs caused by inflation and utilities were large in all instances.

Martorana, Wattenbarger, and Smutz (1978, Pages 8-10) offered these additional indicators of a slow-down in community college expansion which were paraphrased as follows:

1. State legislatures have approved very few new institutions since 1973.
2. There have been a limited number of transformations of vocational-technical schools into comprehensive community colleges.
3. State legislatures in Arkansas, California, Connecticut, Florida, Iowa, and West Virginia have taken steps to place outright restrictions on growth.

It was clear that the primary focus of state legislatures during the past five years has been towards greater financial accountability on the part of post-secondary educational institutions. State legislatures have taken action to insure that they acquired better knowledge about the

expenditure of state appropriated funds, imposed greater state level authority over institutional budgets, required a closer match between appropriations and enrollments, stressed elimination of program duplication, increased state level control, and decreased the funds available.

The year 1976 seemed to be a turning point. The number of financial bills which provided more institutional flexibility outnumbered those which increased state level control by 17 to six. Bills which provided more funds outnumbered those which decreased funds by eight to four. However, in 1977, the state control proposals outnumbered the flexibility bills by 18 to 14, and the bills which provided more funds only outnumbered those which decreased funds by 11 to ten.

Martorana, Wattenbarger, and Smutz (1978, Pages 15-19) listed three additional funding constraints which were paraphrased as follows:

1. New costs were being imposed upon community colleges to cover the additional costs of meeting the 1976 higher education amendments which required that equal access be provided for handicapped persons, that tuition waivers be provided for certain types of residents such as senior citizens, former POW's and dependents of MIA's, and that the mandatory retirement age be extended to 70, which forced colleges to retain higher paid faculty and administrators for up to an additional five years when younger, less expensive, employees would have replaced the more experienced employees.

2. Hidden costs that may have a negative impact on a community college's financial condition included retirement bills, unemployment compensation bills, and administrative costs required to meet certain federal regulations such as the Veterans Administration regulations.

3. As the changing public mood was impacting on community colleges, there was a growing skepticism as to the value of higher education in terms of whether education was worth the investment.

Problems of funding were affecting the implementation of the community college philosophy and mission concerning the development of a comprehensive institution available to all who need continued educational

opportunity and sensitivity to their needs. In the future, community colleges may become restricted to a limited program serving limited community educational needs.

State legislatures have also shown some interest during the last five years in community and junior college academic programs. Attention has been given in the areas of eliminating program duplication, eliminating or restricting community service program funds, focusing attention on faculty work loads and activities, creating legislation which mandated that certain groups such as handicap, disadvantaged, inmates, women, and non-English speaking adults be served.

Coughlin (1978) stated that the 50 states have earmarked nearly $17 billion for operating expenses in 1978-79 for their publicly supported colleges and universities.

He noted that the state tax funds appropriated for higher education for FY 1979 exceeded those of two years ago by 22 percent and, that during the last ten years, the gain was 235 percent according to M. M. Chambers, Professor of Educational Administration at Illinois State University.

In terms of real purchasing power, however, state support for colleges and universities has grown by only seven percent since 1976 and by only 76 percent over the decade.

In Iowa, the state tax funds which were appropriated for higher education this year exceeded those of two years ago by 21 percent or about one percent below the national average. However, the appropriation for 1977-78 per capita was $94.73 and the ranking was 13th as compared to the U.S. average of $78.67. The 1978-79 appropriation per $1000 of personal income in Iowa was $13.77 for a ranking of 15th compared to the U.S. average of $11.22.

The two-year increase in the aid to Iowa community colleges was only 19 percent or two percent below the average to all higher education in the state of Iowa and three percent below the national average.

Jacobson (1977) learned that higher education agencies in 15 of 34 responding states had problems with federal funding of vocational education and that 12 of the agencies did not believe that they had been involved effectively in the state planning. Higher education officials contended that state boards violated federal rules in allocating aid.

Part of the controversy was that final government regulations for the program were not yet issued. Representatives of higher education and vocational education were making different interpretations of major provisions of the law including a section which required that each state spend at least 15 percent of vocational grants for post-high school vocational programs. Total appropriations under the federal legislation exceeded $600,000,000 a year. Typically, the vocational education programs and K-12 districts were administered in each state by a single board, which has had stronger ties to secondary education than to higher education, and, as a result, the 15 percent regulation has not been met by all states.

However, according to the Iowa Vocational Educational Council (1978), a total of 7.78 million dollars in federal vocational aid flowed into the state during FY 1978. Of the total, 4.31 million dollars or approximately 55.4 percent were channeled into post-secondary vocational education programs in the merged area colleges.

Magarrell (1978) found that there was little relationship between taxes collected by states and the amounts appropriated per person for higher education. He also found the comparative wealth of the states and the extent to which that wealth was taxed can be determined by using the new

financial yardstick which was developed by D. Kent Halstead of the National Institute of Education.

Halstead emphasized that year-to-year changes in the relative tax wealth of states were small. The long-term trend has been for the differences in states' wealth to become smaller as the poorer states improve.

The tax capacity per person in 1975 ranged from $970 per person in Nevada to $448 per person in Mississippi. The national average was $643 per person.

State appropriations for higher education for 1978-79 ranged from $176 in Alaska to $32 in New Hampshire. The national average was $79.

In 1975, Iowa ranked 14th in tax capacity, had three percent more taxable wealth than the average state, and would have raised $665 in tax collection if it taxed its wealth at rates equal to the national average. However, in 1975, Iowa taxed its wealth at the rate of only 95 percent, ranked 20th, and raised only $633 per capita.

From the amount raised per capita, Iowa ranked 13th for $95 per capita that was appropriated for higher education.

Roark (1978) reported that the 1979 appropriations for higher education included an appropriation for occupational and vocational education of $774,453,000 compared to $725,750,000 for fiscal 1978. This represented a 6.29 percent increase in actual dollars, but no comparison was made with the increase or decrease in actual purchasing power due to spiraling inflation.

Wattenbarger, Holcombe, Myrick, and Paulson (1973) cited a study done by R. E. Green in 1929 which showed that the average percentages for

financial support of community colleges was as follows: tuition and fees, 49%; local tax levies, 46%; state aid, 3%; and other, 2%.

They also cited a study done by L. H. Arnie in 1969 in which community colleges in 42 states were studied which showed that financial support for community colleges came from the following: local support, 21%; tuition and fees, 20%; state aid, 51%; federal support, 5%, and other sources, 3%.

They also recognized that Arnie's study of 1969 noted that 15 states had moved away from local support entirely. The states included Alabama, Connecticut, Delaware, Georgia, Hawaii, Kentucky, Louisiana, Massachusetts, Minnesota, Nevada, Rhode Island, Tennessee, Utah, Virginia, and Washington.

The shift from the historic local financing of community colleges to increase state financing was reasonable. Local sources of tax revenue were generally not sufficient to: (1) meet the demands of increased enrollments where a large percentage of the population continued its education (2) meet the demands of increased services where the door was truly open to new students with a wider range of abilities and ages (3) meet the demand for comprehensive programming (4) eliminate the barriers to continued education, such as geography and age level (5) insure equal access to citizens without regard to their residence (6) provide equity between the locus of responsibility for education and the benefits received from the education (7) insure minimum standards for producing education of equal quality.

They predicted that during the 1970's community colleges would most likely continue to increase in numbers and in enrollments. Those increases would require larger districts for support, more state support,

and specific minimum standards of expected accomplishments.

Leslie (1975) examined the effects upon community colleges of the major shift in financing higher education by channeling federal aid to higher education to students rather than to institutions directly.

The shift was the result of major recommendations by such groups as the Carnegie Commission, the Committee for Economic Development, the ATWO-Newman Task Forces, the National Commission on the Financing of Post-Secondary Education, and the Joint Economic Committee for Congress.

There was little doubt that the shift had already started and that grants and loans to students were the primary forms of aid. Students were able to transport their awards to the post-secondary institution of their choice. Examples of direct student aid included the Supplemental Educational Opportunity Grant program and the Basic Educational Opportunity Grant program.

He predicted that the total resource pool available to post-secondary education would not increase significantly in the future. Resources channeled into student aid would have to result in two other major changes. The first major change would be that the direct grants to institutions would have to be reduced significantly because no other resource category was sufficiently large to yield the required sums. The second major change would be that the rate of tuition would have to be increased because the presence of grant holding students on a campus contributed nothing to the institutional budget except the tuition paid by that student.

Based upon the recommendations made by the various committees, the theory was developed by the federal government that a kind of market mechanism in higher education was desirable. It was based on the theory

that a freer play of market forces would best achieve federal objectives in post-secondary education. Accountability through student choice would accordingly make institutions and programs accountable to the national interest.

He speculated that because community colleges were low status institutions, it might be predicted that the transfer curricula of two-year colleges would tend to be at a disadvantage in the market when compared to the lower division programs of the more elite four-year institutions. However, programs giving direct attention to the development of job-related skills was predicted to be more attractive to many students who were interested in an immediate yield or better return for each dollar invested.

Another significant expectation because of the freer student choice to spend his financial aid in the institution of his choice and because private institutions were perceived to yield a higher economic return to the educational investor was that private colleges will be the recipient of a large flow of resources.

In summary, he projected that the public community colleges would appear to be the net losers of the major shift of aiding higher education through direct aid to students because community colleges probably would not respond with drastically higher tuition rates.

Wygal (1975) stated that the economy was a threat to crunching community based education. Community based education occurred when community needs were well documented and jobs were available in the local community for those who were a product of the training programs.

He concluded that we dare not even entertain the notion of failure

in community based education because such education must be the approach of the community college of the future in spite of a continuing recession. We must reach out to people who have not prepared themselves to go to college and to people whose specific needs for higher education are not being met. We must include people who have all kinds of special limitations that do not allow them to move about freely within the community to meet specific schedules.

The new growth in the community college education should be nontraditional education offering unique and innovative programs to meet needs of nontraditional students.

A variety of barriers to these new students must be removed by providing new delivery systems and new approaches to loosening the traditional structure of the credit hour, the classroom, the semester schedule, and the admissions procedures.

History and Purpose of Vocational Education

According to the American Institute for Research (1976), vocational education became a national program with the enactment of the Smith-Hughes Act, which officially provided the first federal aid for vocational education in 1917. Prior to that time, the Morrill Act of 1862 donated public lands to the several states and territories in the amount of 30,000 acres per state for each senator and congressman for the purpose of teaching branches of learning in agriculture and the mechanical arts. The Smith-Hughes Act was an automatic appropriation bill providing a grant in perpetuity to the states of approximately $7.2 million annually.

The Vocational Education Act of 1963 and the Amendments of 1968 were contemporary vocational education legislation which provided the basis

for the current vocational education. The Vocational Education Act of 1963 was a law enacted to authorize federal grants to states to assist them to maintain, extend, and improve existing programs of vocational education, to develop new programs of vocational education, and to provide part-time employment for youth who needed the earnings to continue their vocational training on a full-time basis.

The Vocational Education Act of 1963 was the first modernization and revitalization of the national program in five decades. It focused on services to people--meeting the needs of individuals--in contrast to prior acts which only provided for training personnel in a few occupational categories. The intent of the new act was clearly to provide services to people without respect to predetermined occupational groupings.

The Vocational Education Amendments of 1968 amended all previous vocational education acts. It differed from the 1963 Act in that those in post-secondary schools were specified among the groups which will have ready access to vocational training or retraining. The 1968 Amendment specified that the funds allocated to the states were to be used to maintain, extend, and promote vocational education programs to meet the needs of high school students, high school graduates and dropouts, employed who need training or upgrading, and handicapped.

In general, the conditions that provided the impetus for the enactment of the Vocational Education Act of 1963 were greatly intensified and, in turn, provided impetus for the enactment of the Vocational Education Amendments of 1968. In general, these conditions were high rates of unemployment, shortage of skilled manpower, and the growing economic and social disparity between the employable and the unemployable. The

Amendments of 1968, emphasized meeting the needs of the individual, particularly the needs of the socially, economically, and culturally disadvantaged.

The Education Amendments which became effective June 23, 1972, were considered one of the most comprehensive pieces of federal legislation for education ever passed. They amended the Higher Education Act of 1965, the Vocational Education Act of 1963, the General Education Provisions Act, and the Elementary and Secondary Education Act of 1965. Title X of the Education Amendments of 1972 had the greatest significance to vocational education because it required that each state establish a Post-secondary Education Commission for the purpose of developing a statewide plan for the expansion or improvement of post-secondary education programs in community colleges.

The American Institute for Research (1976) identified the basic principles of vocational education as it related to the optimum utilization of human resources, the needs of the economy, and the social structure. Vocational education related to the people and the work they do. These principles were clearly reflected in the most current legislative mandate for vocational education which was the Vocational Education Amendments of 1968. The Declaration of Purpose of this document stated by the American Institute of Research (1976, Pages 3 and 4) was quoted as follows:

> "It is the purpose of this title to authorize federal grants to states to assist them to maintain, extend, and improve existing programs of vocational education, to develop new programs of vocational education, and to provide part-time employment for youths who need the earnings from such employment to continue their vocational training on a full-time basis, so that persons of all ages in all communities of the state--

> those in high school, those who have completed or discontinued their formal education and are preparing to enter the labor market but need to upgrade their skills or learn new ones, those with special educational handicaps, and those in post-secondary schools--will have ready access to vocational training or retraining which is of high quality, which is realistic in the light of actual or anticipated opportunities for gainful employment, which is suited to their needs, interests, and ability to benefit from such training."

The development of vocational curricula was unique in the field of education. Vocational education was based on an integrated and continuing process of analyzing the needs of industries and individuals that it served. Program planning began with the analysis of the manpower needs and the opportunities of the businesses and industries that made up society, of the population or student needs and interests, and of the constraints and the resources with which the school system and the economy had to operate.

Manpower forecasts were frequently unreliable due to statistical and sampling procedures which were inappropriate because of the use of materials that were no longer current or correct and because of an unstable economic and political climate.

Manpower forecasting was not a science. The studies and resulting data were not always accurate and dependable. Short range forecasts were more accurate than long range forecasts.

The Research Foundation of the City University of New York (1977) included an article written by Anna H. Laney entitled, The Need for Cooperative Education Pros & Cons. Laney stated that cooperative education was not a new concept. It was started in 1906 at the University of Cincinnati by Professor Herman Schneider. However, the cooperative

education concept didn't experience any real growth in higher education until the post-World War II education explosion which was fueled by the GI Bill.

During the 1960's, cooperative education seemed to be the answer to the demands by minorities and the urban poor for skills, education, and upward mobility. Educators worked hard to convince Federal and State legislators of the social, political, and economic advantages of supporting cooperative education programs. Federal funds in support of Cooperative Education were authorized by Title IV, Part D, of the Higher Education Amendments of 1968.

Federal appropriations for cooperative education included $10,000,000 in 1976, $15,000,000 in 1977, $18,000,000 in 1978, and $29,000,000 in 1979. By 1976, there were approximately 1,100 institutions of higher education reporting cooperative education programs in which 200,000 students and 18,000 employers were involved. The projection was that by 1980, between 1,900 and 2,000 of the 3,200 institutions of higher education would be involved in cooperative education. The Research Foundation of the City University of New York (1977, Pages 62 and 63) identified the benefits and problems of cooperative education as paraphrased below:

1. Students were aided because actual work experience was incorporated into the educational process which helped to enrich a student's academic and occupational aims.

2. Students had an opportunity to try their career choice and if they found that they were unsuited, they could change before they wasted a lot of time and effort in preparing for the wrong career.

3. Students were able to earn at least part of the money that they needed for college expenses as well as personal spending money.

4. Students with work experience through cooperative education often found that they had a head start in the job market because they had increased self-confidence, self-awareness, and a sense of responsibility.

5. Public and private businesses who contracted with the colleges and hired cooperative education students benefited by filling their immediate manpower needs and by having a pool of proven talent to draw on later when students graduated.

The main problem with cooperative education was that it was a more expensive program to offer than traditional types of lecture courses. Federal money given to a college to introduce cooperative education programs almost certainly expired after a maximum of three years. The added financial burden then became the total responsibility of the institution. Institutions of higher learning were finding it more difficult to assume these added costs.

Chapter 3

PROCEDURES AND METHODOLOGY

Research Methodologies

The methodologies which were utilized in this study included elements of the historical literature search, statistical analysis among variables, case-study, and descriptive. An appropriate approach or combination of approaches were constructed for each research question in accordance with the purpose and content of that question.

The methodologies were as follows:

Question 1:

How did the current FTEE formula evolve?

Approach:

Historical literature search.

Purpose:

To demonstrate an understanding of the development of the current Iowa community college FTEE formula.

Procedures:

Various documents of the Department of Public Instruction together with the publications and documents of various authors were read and analyzed in order to write and present in narrative text a history of the evolution of state aid funding and the FTEE formula.

Question 2:

Were there significant differences among mean percents of RCH among programs comparing the 15 merged area colleges which were caused by allowing flexibility in the formula application when calculating FTEE and which resulted in incorrect program cost comparisons and inequitable state general aid distribution?

Approach:

Statistical analysis among variables and case-study.

Purpose:

To determine if the FTEE formula was a reliable unit of measurement and if the application of the current FTEE formula did cause an inequitable distribution of state aid funds among the merged area schools.

Procedures:

1. Two forms were designed on which to record the necessary RCH data about each vocational program in operation within the 15 area community colleges (See Appendix F and G).

2. The source of the statistical data was the Department of Public Instruction. The vocational branch of the Department of Public Instruction maintained a historical file on each vocational program operated within the area community colleges in the state of Iowa. By going through each program file, the lecture, lab, and coop hours for each program were secured. The data were put on the forms mentioned in item one.

3. The sample on which these data were gathered was a 100 percent sample on 504 vocational programs. The data obtained on each one of the vocational programs were utilized in the following steps:

   a. Lecture, lab, and coop hours were added together to get the total contact hours for each program.

   b. The percent that the lecture contact hours were of the total contact hours was calculated by dividing lecture contact hours by total contact hours.

c. The percent of lab contact hours was calculated by dividing the lab contact hours by the total contact hours.

d. The percent of coop contact hours was calculated by dividing the coop contact hours by the total contact hours.

e. The total RCH were calculated by adding the lecture hours and one-half of the lab and coop contact hours.

f. The percent that the RCH were of the total contact hours was calculated by dividing the total RCH by the total contact hours.

4. The raw data were converted into percents to make possible the comparison of programs of varying lengths.

5. The operational null hypothesis was that there was not a significant difference at the .05 percent level among the mean percents of RCH among the area colleges. To test the operational null hypothesis, the completely randomized design of analysis of variance was used to determine if the calculated F value indicated acceptance or rejection at the .05 level.
Duncan's Multiple Range Test was applied to compare each individual area college to every other area college to determine specifically where the significant differences existed. The F Test and Duncan's Multiple Range Test were employed through the data processing center at Iowa Lakes Community College with the use of Burroughs 6700 hardware and by two software applications, designed and written by the computer center director and programmer.
The t Test for a difference between a sample mean and the population mean was used to determine if there were significant differences at the .05 percent level among the means of all fifteen merged area colleges and the grand mean of all fifteen colleges.

6. Two forms were designed on which to record the FTEE statistics and the cost analysis data for the individual program taxonomies which made up the sample to be analyzed (See Appendix H and I). Five programs were chosen at random using a table of random numbers from those taxonomies containing more than one program. This guaranteed a range from high RCH to low RCH and a mean RCH for all schools.

7. The FTEE data were obtained from the student records division of the area school branch in the Department of Public Instruction. The financial cost data were obtained from the fiscal branch of the Area School Division of the

Department of Public Instruction. The FTEE data and the financial cost data was extracted from the records and recorded on the forms which were designed. Data were also extracted from the forms in Appendix F and G. From Appendix I, which identified the particular taxonomies which were selected for the case studies for this research question, the school with the lowest percent of RCH and the school with the highest percent of RCH were selected for use as well as the mean percent of the RCH from all schools.

8. Data which were obtained on each of the individual taxonomies selected for the case studies were the percent of RCH in the school which had the lowest percent, the percent of RCH in the school which had the highest percent, the mean percent of RCH from all schools, the FTEE generated in the school which had the lowest RCH percent, the FTEE generated in the school which had the highest RCH percent, and the cost of the FTEE in the high and the low school.

The steps to determine the effects of the FTEE formula as applied in fiscal 1977 on the number of FTEE generated and on the cost comparison of FTEE in case studies of five program taxonomies were as follows:

1. Calculate FTEE generated in the college with the lowest percent of RCH if the percent from the highest college were applied:

   a. Multiply FTEE generated in college with lowest percent of RCH times 540 RCH = total RCH.

   b. Divide total RCH by present percent of RCH in college with lowest percent = total contact hours.

   c. Multiply total contact hours by present percent of RCH in college with highest percent = total RCH.

   d. Divide total RCH by 540 RCH = answer for #1.

2. Calculate FTEE generated in the college with the lowest percent of RCH if the mean percent from all colleges were applied:

   a. Multiply FTEE generated in the college with lowest percent of RCH times 540 RCH = total RCH.

   b. Divide total RCH by present percent of RCH in college with lowest percent = total contact hours.

   c. Multiply total contact hours by mean percent of RCH from all Iowa area colleges = total RCH.

   d. Divide total RCH by 540 RCH = answer to #2.

3. Calculate FTEE generated in the college with highest percent of RCH if the percent from the lowest college were applied:

   a. Multiply FTEE generated in college with highest percent of RCH times 540 RCH = total RCH.

   b. Divide total RCH by present percent of RCH in college with highest percent = total contact hours.

   c. Multiply total contact hours by present percent of RCH in college with lowest percent = total RCH.

   d. Divide total RCH by 540 RCH = answer for #3.

4. Calculate FTEE generated in the college with highest percent of RCH if the mean percent from all colleges were applied:

   a. Multiply FTEE generated in the college with highest percent of RCH times 540 RCH = total RCH.

   b. Divide total RCH by present percent of RCH in college with highest percent = total contact hours.

   c. Multiply total contact hours by mean percent of RCH from all Iowa area colleges = total RCH.

   d. Divide total RCH by 540 RCH = answer to #4.

5. Calculate cost of FTEE in the college with lowest percent of RCH if the percent from the college with the highest were applied:

   a. Multiply cost of FTEE in the college with lowest percent of RCH times FTEE generated in college with lowest percent of RCH = total cost of program in college with lowest percent of RCH.

   b. Divide total cost of program in college with lowest percent of RCH by FTEE generated in the college with the lowest percent of RCH if the percent from the highest were applied = answer to #5.

6. Calculate cost of FTEE in the college with lowest percent of RCH if the mean percent from all colleges were applied:

   a. Multiply cost of FTEE in the college with lowest percent of RCH times FTEE generated in college with lowest percent of RCH = total cost of program in college with lowest percent of RCH.

b. Divide total cost of program in college with lowest percent of RCH by FTEE generated in the college with lowest percent of RCH if the mean percent from all colleges were applied = answer to #6.

7. Calculate cost of FTEE in the college with the highest percent of RCH if the percent from the college with the lowest were applied:

   a. Multiply cost of FTEE in the college with highest percent of RCH by FTEE generated in college with highest percent of RCH = total cost of program in the college with the highest percent of RCH.

   b. Divide total cost of program in the college with the highest percent of RCH by FTEE generated in college with highest percent of RCH if the percent from the lowest were applied = answer to #7.

8. Calculate cost of FTEE in the college with highest percent of RCH if the mean percent from all colleges were applied:

   a. Multiply cost of FTEE in the college with highest percent of RCH times FTEE generated in college with highest percent of RCH = total cost of program in college with highest percent of RCH.

   b. Divide total cost of program in college with highest percent of RCH by FTEE generated in the college with highest percent of RCH if the mean percent from all colleges were applied = answer to #8.

The data furnished on the three forms in Appendices F, G, and H provided the basis to test the operational null hypothesis in research question 2 by showing if significantly different percents of RCH were being translated into FTEE among the 15 merged area colleges.

The data furnished on the form in Appendix I showed the impact of any significant differences on the number of FTEE generated and on the cost per FTEE.

Question 3:

Were there existing funding methodologies of proven effectiveness for the distribution of state aid funds?

Approach:

Descriptive.

Purpose:

To demonstrate a knowledge of alternative funding methodologies and to provide a background for the comparison and modification or replacement of the current Iowa community college FTEE formula.

Procedures:

This question was answered by the following steps:

1. A thorough review of the literature on state aid distribution models used in other states.
2. Review of other studies done on state aid distribution models and units of measurement of productivity.
3. Review of legislative trends which related to community college financing and curriculum.

A review of the pertinent literature was undertaken and a descriptive summary of the findings were presented.

Variables

The independent variables in this study included FTEE formula applications, instructor salary differential because of seniority and salary schedule, varying student-teacher ratios, varying support services, varying physical facilities, tuition income, local tax income, and federal vocational aid income.

The dependent variable in this study was state aid which was distributed by the Department of Public Instruction to the various merged area colleges.

Chapter 4

FINDINGS

This chapter reports the data which were gathered to answer the three research questions which were presented in Chapter 1 and to determine whether the null hypothesis which was stated in Chapter 3 should be accepted or rejected.

The first research question asked how the current Iowa community college FTEE formula evolved? The historical data located through the literature search revealed the evolution of the Iowa FTEE formula.

Historical Development of Iowa's FTEE Formula

The first unit of measurement which was used from 1966 through 1972 was the average daily enrollment (ADE). A full-time student was one who carried 12 or more semester hours. Full-time equivalents were computed for part-time students by dividing the semester hours of part-time students by 12.

A significant change was made in the unit of measurement for the second half of the 1971-73 biennium. FTEE became the unit of measurement and was still in use at the time of this study. The definition of FTEE was 540 RCH. The formula stated that the FTEE generated by a college was the quotient of the total number of RCH carried by residents of the state attending a single area school divided by 540. The 540 was based on a

student generating 15 RCH per week for a period of 36 weeks. The key to this formula became RCH. The formula further specified that a RCH means any of the following:

1. One contact hour of lecture in an approved course in arts and sciences or vocational-technical education.

2. Two contact hours for laboratory in approved courses in arts and sciences or vocational-technical education.

3. Two contact hours in an approved course of adult education that is eligible for state general aid except that adult basic education, high school completion, and college credit courses that qualify as lecture courses will be reimbursed on a one contact hour basis. Courses dealing with recreation, hobbies, casual culture, or self-enjoyment subjects will not be eligible for reimbursement.

The funding formula for 1977-79 was further refined to take into account concerns expressed by merged area schools for inclusion of additional factors and particularly the need for new cost centers. A significant change occurred at this point in that the significance of the FTEE in the distribution of state aid was greatly diminished. The number of cost centers was expanded to eleven major categories with two of the major cost centers being further subdivided causing a total of approximately 135 different cost centers.

Each cost center was adjusted forward for both direct and indirect costs by an inflationary factor of 7.8 percent based on expenditures during FY 1977. A significant change in the procedure for applying vocational reimbursement was also included in the formula. The reimbursement procedure for preparatory career programs was uniformly changed to an excess cost factor. This factor was determined by computing for each preparatory career cost center the amount above, if any, the average FTEE cost for college parallel programs.

Once the allowable expenditures were set, the income sources for funding were determined. The general aid request resulted from subtracting all of the other sources of income from the total allowable expenditures which left the amount needed to balance the budget.

The FTEE, as a unit of measurement, played a very insignificant role in the distribution of state general aid for FY 1979, although the FTEE continued to be the unit of measurement to determine units of production for purposes of production comparison and cost analysis. The significant basis for consideration became the cost center itself and the total program cost of operation for fiscal 1977. The fiscal 1977 budget became the base budget and allowances for inflation for 1977 and 1978 were allowed to be added on to the base program cost for 1977.

This represented a major shift away from even considering the units of production within a cost center as one of the basic considerations for the distribution of state aid.

Results of F Test

The second research question in this study asked if there were significant differences among mean percents of RCH of vocational programs comparing the 15 merged area colleges which were caused by allowing flexibility in formula application when calculating FTEE and which resulted in incorrect program cost comparisons and inequitable state general aid distribution.

The first result of this study, which pertained to the second research question, was a table of the final analysis obtained through the completely randomized design of the two-way analysis of variance. The first issue to be resolved was centered around the operational null

hypothesis which stated that there was not a significant difference at the .05 percent level among the mean percents of RCH among the area colleges. The final analysis of the F Test to determine the level of significance was tabled (Table 1).

Since the F value of 5.6730, with df of 14 and 490 would occur by chance less than once in 1,000 times, it was concluded that there were significant differences among the mean percents of RCH among the area colleges. Therefore, the operational null hypothesis was rejected at the .05 percent level.

The second result, centered around research question 2, was a summary of the printout of multiple comparisons (See Appendix J) resulting from the application of Duncan's Multiple Range Test that showed which mean percents of RCH among the area colleges were significantly different from each other.

The mean RCH from each community college was compared to the mean RCH from all of the other 14 colleges. This test entailed 105 comparisons. The results were that 19 of the 105 comparisons showed significant differences in the mean RCH between the two colleges being compared (See Appendix J).

Results of t Test

The third result, centered around research question 2, was Table 2 which compared the t Statistic and the T Value to determine if the mean percent that RCH were of total contacts by college differed significantly at the .05 percent level from the grand mean of all 15 colleges.

TABLE 1

This shows the results of applying the completely randomized design of analysis of variance to obtain the F value for acceptance or rejection of the null hypothesis

Source	SS	df	ms	F	P
Total	23341.4541	503			
Between Groups	3261.3719	14	232.9551	5.6730	.001
Within Groups	20080.0795	489	41.0636		

TABLE 2

A comparison of t statistic and t value to determine if the mean percent that RCH are of total contact hours by college differed significantly at the .05 level from the grand mean of all 15 colleges

Merged Area School	Mean Percent That RCH Are of Total Contacts By College	Grand Mean Of All 15 Area Colleges	Percent Deviation From Grand Mean	df	t Statistic At .05 Level	t Value	Significant At .05 Level
I	71.158	70.655	+ .503	35	2.032	.898	No
II	70.365	70.655	- .290	19	2.093	.518	No
III	71.526	70.655	+ .871	18	2.101	1.555	No
IV	67.137	70.655	- 3.518	23	2.069	6.282	Yes
V	68.753	70.655	- 1.902	27	2.052	3.396	Yes
VI	69.354	70.655	- 1.301	21	2.080	2.323	Yes
VII	70.693	70.655	+ .038	40	2.021	.068	No
IX	68.489	70.655	- 2.166	34	2.030	3.868	Yes
X	70.152	70.655	- .503	64	1.999	.898	No
XI	76.506	70.655	+ 5.851	68	1.998	10.448	Yes
XII	68.711	70.655	- 1.944	43	2.018	3.471	Yes
XIII	71.819	70.655	+ 1.164	30	2.042	2.079	Yes
XIV	71.714	70.655	+ 1.059	13	2.160	1.891	No
XV	72.439	70.655	+ 1.784	32	2.038	3.186	Yes
XVI	71.013	70.655	+ .358	22	2.074	.639	No

This table showed that area colleges IV, V, VI, IX, XI, XII, XIII, and XV had a mean percent of RCH that did differ significantly at the .05 percent level from the grand mean of all 15 colleges.

FTEE Formula Impact on Units of Production and Cost

The fourth result, centered around research question 2, was a series of four tables which showed if the significant differences among the mean percents of RCH among the 15 merged area colleges resulted in incorrect program cost comparisons and inequitable state general aid distribution.

Table 3 showed a comparison of FTEE generated in five sample programs from the college with the lowest percent of RCH if the percent from the highest and if the mean percent from all colleges were applied. The flexibility in the FTEE formula calculation procedures resulted in very significant FTEE percentage variances when the percent of RCH from the highest college was applied to the RCH from the college with the lowest percent. In the five case-study programs, which were picked at random, the percentage of variance ranged from 20.52 to a high of 33.04.

The effect on cost which is shown in Table 4 showed that the effect on the cost of FTEE by simply substituting the percent of RCH from the highest school in the college with the lowest percent of RCH resulted in an FTEE cost variance ranging from $160.83 to $460.15. Because the application of the highest percent would have resulted in the generation of larger numbers of FTEE, the cost of FTEE's would have been lowered.

Tables 5 and 6 showed the FTEE variance and the FTEE cost variance if the percent of RCH from the lowest school applied in the college with

TABLE 3

A Comparison Table of FTEE Generated in Sample Programs from the College with the Lowest Percent of RCH if the Percent from the Highest and if the Mean Percent from all Colleges were Applied

Program Taxonomy	FTEE From College With Lowest Percent Of RCH	FTEE If Percent From Highest Were Applied	FTEE Variance By Applying Highest Percent of RCH	Percentage Variance
01-01000000	63.91	80.33	+16.42	+25.69
04-08010000	40.31	48.58	+ 8.27	+20.52
07-03020000	6.81	9.06	+ 2.25	+33.04
16-01080000	24.27	30.89	+ 6.62	+27.28
17-03020000	29.18	36.01	+ 6.83	+23.41

(Continued)

Program Taxonomy	FTEE If Mean Percent From All Colleges Were Applied	FTEE Variance By Applying Mean Percent of RCH	Percentage Variance
01-01000000	69.58	+5.67	+ 8.87
04-08010000	43.77	+3.46	+ 8.58
07-03020000	7.86	+1.05	+15.42
16-01080000	28.07	+3.80	+15.66
17-03020000	33.38	+4.20	+14.39

TABLE 4

A Comparison of Cost Per FTEE in Sample Programs from the College with Lowest Percent of RCH if the Percent from the Highest and if the Mean Percent from all Colleges were Applied

Program Taxonomy	Cost From College With Lowest Percent of RCH	Cost If Percent Of RCH From Highest Were Applied	FTEE Cost Variance By Applying Lowest Percent of RCH	Percentage Variance
01-01000000	2251.15	1791.00	-460.15	-20.44
04-08010000	1809.03	1501.07	-307.96	-17.02
07-03020000	1685.02	1266.55	-418.47	-24.83
16-01080000	1814.83	1425.89	-388.94	-21.43
17-03020000	847.94	687.11	-160.83	-18.97

(Continued)

Program Taxonomy	Cost of Mean Percent From All Colleges Were Applied	FTEE Cost Variance By Applying Mean Percent of RCH	Percentage Variance
01-01000000	2067.71	-183.44	- 8.15
04-08010000	1666.03	-143.00	- 7.90
07-03020000	1459.92	-225.10	-13.36
16-01080000	1569.15	-245.68	-13.54
17-03020000	741.25	-106.69	-12.58

TABLE 5

A Comparison of FTEE Generated in Sample Programs from the College with Highest Percent of RCH if the Percent from the Lowest and if the Mean Percent from all Colleges were Applied

Program Taxonomy	FTEE From College With Highest Percent of RCH	FTEE If Percent From Lowest Were Applied	FTEE Variance By Applying Lowest Percent of RCH	Percentage Variance
01-01000000	105.27	83.75	-21.52	-20.44
04-08010000	53.07	44.03	- 9.04	-17.03
07-03020000	48.91	36.77	-12.14	-24.82
16-01080000	44.58	35.03	- 9.55	-21.42
17-03020000	18.01	14.60	- 3.41	-18.93

(Continued)

Program Taxonomy	FTEE If Mean Percent From All Colleges Were Applied	FTEE Variance By Applying Mean Percent of RCH	Percentage Variance
01-01000000	91.18	-14.09	-13.38
04-08010000	47.81	- 5.26	- 9.91
07-03020000	42.46	- 6.45	-13.19
16-01080000	40.52	- 4.06	- 9.11
17-03020000	16.69	- 1.32	- 7.33

TABLE 6

A Comparison of Cost Per FTEE in Sample Programs from the College with Highest Percent of RCH if the Percent from the Lowest and if the Mean Percent from all Colleges were Applied

Program Taxonomy	Cost From College With Highest Percent of RCH	Cost If Percent Of RCH From Lowest Were Applied	FTEE Cost Variance By Applying Lowest Percent of RCH	Percentage Variance
01-01000000	1589.73	1998.22	+408.49	+25.70
04-08010000	1446.86	1743.92	+297.06	+20.53
07-03020000	1471.34	1957.12	+485.78	+33.02
16-01080000	1327.05	1688.93	+361.88	+27.27
17-03020000	1755.41	2165.41	+410.00	+23.36

(Continued)

Program Taxonomy	Cost If Mean Percent From All Colleges Were Applied	FTEE Cost Variance By Applying Mean Percent of RCH	Percentage Variance
01-01000000	1835.39	+245.66	+15.45
04-08010000	1606.04	+159.18	+11.00
07-03020000	1694.85	+223.51	+15.19
16-01080000	1460.02	+132.07	+10.02
17-03020000	1894.24	+138.83	+ 7.91

the highest percent of RCH. The application of the percent from the lowest schools resulted in a decrease of FTEE generated ranging from 17.03 percent to 24.82 percent. Because less FTEE would have been generated, the cost per FTEE would have gone up from $29[illegible].06 in the low case to $485.78 in the highest example with a percentage increase ranging from 20.53 percent to 33.02 percent.

Extant Funding Methodologies

The third research question asked if there were other existing funding methodologies of proven effectiveness in other states for the distribution of state aid funds.

The results of the literature search revealed the following about state community college systems:

1. Every state has developed a method of measuring and comparing production.
2. Units of production included credit hours granted, student contact hours, average daily attendance based on headcount, and FTEE.
3. Every state provided some type of general aid which was usually distributed on the basis of productivity.
4. The credit hour and the student contact hour were the two most commonly used units of measurement.

The funding methodology used in Florida, which was based on credit hours and the one used in Texas, which was based on student contact hours were two existing acceptable models for an equitable distribution of state general aid (See Appendices K and L).

Chapter 5

SUMMARY AND CONCLUSIONS

Summary

Three funding methodologies have been used to distribute state general aid among Iowa's community colleges. From 1966-73, the unit rate formula was used. The unit of measurement was ADE and was calculated on the basis of 12 semester hours being considered as a full-time student.

For FY 1973, the unit of measurement changed significantly from ADE to FTEE. FTEE was defined as the quotient of the total number of RCH accumulated by residents of the state attending a single area school divided by 540 which was based on 15 RCH per week for a period of 36 weeks. The FTEE formula allowed for different ratios of RCH for courses and programs which were offered in the adult education division, the arts and sciences division, and the vocational division. Classroom lecture hours were reimbursable on a two for one basis. The FTEE was the unit of measurement from FY 1973-79. There were no changes in the definition.

For FY 1974-78, a combination of the unit rate formula and the cost-based program funding methodologies were used. In 1975, average costs for FTEE were determined. The state general aid formula was based on four cost centers including adult, college parallel, vocational, and agricultural production for veterans. The average statewide cost for each of these cost centers was determined for FY 1974 and each cost center was then multiplied

by the number of FTEE in each area college by cost center. A similar procedure was followed through FY 1977.

In FY 1978, a significant change occurred in the funding methodology when the significance of the FTEE in the distribution of state aid was greatly diminished. The number of cost centers was expanded to eleven major categories. Two of the major categories were further subdivided causing a total of approximately 135 different cost centers. Each of the cost centers was simply adjusted forward for both direct and indirect costs by an inflationary factor based on FY 1977. However, a significant change in the procedure for applying vocational reimbursement was also included in the formula. The reimbursement procedure for preparatory career programs was uniformly changed to an excess cost factor. This factor was determined by computing for each preparatory career cost center the amount, if any, that the average FTEE cost was above or below the average for the college parallel programs. Those programs that fell below the average college parallel cost were given special consideration to move them upward toward the average.

For FY 1979, the funding methodology was based entirely on cost-based program funding. FTEE played a very insignificant role in the distribution of state general aid. The significant basis for funding became the cost center itself and the total program cost of operation for FY 1977 became the base budget with allowances for FY 1978 inflation.

The data gathered on the forms in Appendices F and G to answer the second research question showed that a very high percent of the vocational programs with identical taxonomies varied considerably in the percentage of RCH which were claimed by each community college for conversion into FTEE.

The results of the F Test (See Table 1, Page 78) clearly showed that the null hypothesis was rejected at the .05 level. There were significant differences among the 15 community colleges in the mean percents of RCH of vocational programs which were caused by allowing flexibility in formula application when FTEE were calculated.

An RCH mean was determined for each of the area colleges based on the programs in that college. The Duncan Multiple Range Test was used to compare the mean RCH from each community college with that of every other community college in the state of Iowa to determine exactly where the significant differences were. The results of the Duncan Multiple Range Test showed that 19 of the 105 comparisons showed significant differences in the mean RCH (See Appendix J).

Another comparison was made to determine if the mean percent that RCH were of total contacts by college differed significantly at the .05 level from the grand mean of all 15 colleges. In this comparison, the mean percent of RCH was determined for each college and a RCH grand mean was determined for all 15 area colleges. The t statistic was used to compare each individual college mean with the grand mean. The results showed that eight of the 15 community colleges varied significantly at the .05 level from the grand mean.

This statistic was important only because Iowa's community college system had not differentiated or categorized programs into groups according to similar costs. Each unit of production was given equal consideration regardless of cost. These data clearly showed that there was not an averaging effect among the RCH within each college which eliminated significant differences in the RCH among colleges.

The literature search revealed that there were other existing funding methodologies that were using reliable units of measurement which have been proven effective as a means of distributing state general aid.

The Texas community college system (See Appendix L) was an example of a statewide community college system which used the student contact hour as a basis on which to distribute state general aid. No further conversions were made. In comparison, the Florida community college system used the student contact hour as a basis but converted the student contact hours into semester credit hours. Student contact hours in vocational programs were divided by 27 to determine the number of semester credit hours generated. The semester credit hours were then divided by 30 to determine the number of FTEE. In the arts and sciences, there were less student contact hours per credit hour than in the vocational programs. The difference between the actual number of student contact hours and the number 27 were actually forgiven on the basis that the student put in more outside preparatory time in the academic areas.

Conclusions

The first conclusion was that the funding methodologies used to distribute state general aid among Iowa's community colleges moved away from any cost accountability when cost-based program funding was adopted in FY 1979.

The second conclusion was that the FTEE formula was an unreliable unit of measurement. Because of the flexibility allowed to individual institutions in determining the ratios of lecture to laboratory hours in vocational programs, individual colleges generated varied amounts of FTEE in identical programs considering the same number of student contact hours.

The third conclusion was that student contact hour, credit hour, or FTEE were all acceptable units of measurement provided that there was a standard definition for each and that the student contact hour was the basis for calculating credit hours and/or FTEE.

Implications

The implication of adopting the cost-based program funding, based purely on program expenditures, was that it could lead to program decay because there would be no incentive to update curriculum that had lost its appeal to students and its relevancy to employers. With no emphasis on productivity, there would be little incentive for faculty to be concerned with student achievement and competency levels and for colleges to market their programs and services in an effort to fill the classrooms.

The implication of an unreliable unit of measurement was that the numbers of FTEE generated within programs among the various area colleges and the cost of those FTEE's were not accurately reported.

To show the effects of the unreliable FTEE formula on cost per FTEE and numbers of FTEE generated, five program taxonomies were selected at random as case studies (See Tables 3-6, Pages 81-84). These tables clearly showed that the numbers of FTEE were severely affected in a particular college simply because of how the FTEE formula was applied in calculating RCH. Because the cost of FTEE was determined by dividing the total program cost by the total FTEE generated, the cost comparison information was also invalid.

The invalid cost comparison data proved that there was, in fact, an equitable distribution of state aid during FY 1977. The funding methodology used for FY 1977 allowed for vocational programs which fell below the

state average cost to receive extra state aid to move them toward the state average for that program cost center. Tables 3-6 proved that there was not a reliable unit of measurement nor valid cost comparisons to determine which programs were, in fact, below the state average expenditures.

The implication of the statement that student contact hour, credit hour, and FTEE were all acceptable units of measurement that could be used in a funding methodology was that Iowa's community colleges could continue to use FTEE as their unit of measurement if the calculation procedures were revised.

Recommendations

The first recommendation was based on what Chaung (1977) stated. The American taxpayer was interested in relevant and high quality education, and educators should be held accountable for providing it. The future funding methodology in Iowa should consider both production and cost of efficiency.

The second recommendation was that Iowa either choose a new unit of measurement on which to base its funding methodology or change the existing unit of measurement so that it would be reliable for valid cost and unit of production comparisons. The results of the F Test showed that the FTEE formula procedures were not reliable. Tables 3-6 showed the impact of the unreliable formula on the number of FTEE generated and on the cost per FTEE.

The single most important factor in any unit of measurement was that it should have been based upon some reliable measure which accurately reflected production of educational institutions. Wattenbarger and Starns (1976) indicated that the student contact hour was the most reliable base unit of measurement from which to start. Other units of measurement which

may be calculated from the student contact hours, such as credit hours or FTEE should be a result of a direct conversion based on those contact hours and not on ratio formulas such as Iowa had.

The third recommendation was that FTEE be continued as the unit of measurement for Iowa's community colleges. The FTEE is a meaningful unit of production to educators, legislators, and other citizens who can use it for making program cost and productivity evaluations. However, the formula for computing FTEE should contain the following procedures and definitions:

1. The student contact hour should be 60 minutes, of which 50 are instructional and ten are allowed for passing to classes and/or student break.

2. The FTEE should be computed directly from the student contact hour with no conversions based on lecture or laboratory. This procedure would solve the problem of different amounts of FTEE generated in programs with identical taxonomies because of the flexibility in the formula application.

3. One vocational FTEE should equal 900 student contact hours. This is based on a vocational student attending classes for five hours per day for 180 days, which was the required length for the academic year.

4. One arts and sciences FTEE should equal 540 student contact hours. This is based on an arts and sciences student attending classes for 15 hours per week for 36 weeks (180 days).

5. One adult education FTEE should equal 540 student contact hours in all program categories except the vocational short-term preparatory, in which one FTEE should be equal to 900 student contact hours.

FTEE should be calculated on the basis of the students enrolled at the end of the second week of each term in all vocational and arts and sciences programs, and after the second session of all adult short courses that have a definite starting and finishing date. FTEE should be calculated for programs such as Adult Basic Education, which runs on a continuing basis, by recording student contact hours on each enrollee according to a well-defined attendance policy. This procedure would reduce many of

the costly and time-consuming procedures of accounting for student contact hours gained or lost during the remainder of the term caused by students dropping or adding courses. This concern was expressed by the FTEE Review Committee (See Appendix C).

Credit hours were also significant units of measurement to the Management Information System (MIS) of the Iowa community colleges. Three examples included determining tuition for part-time students, distributing tuition to the appropriate cost centers or course budget analysis comparisons of income to expenditures, and identification of part-time and full-time status.

Credit hours should be granted as follows:

> Vocational - one for 20 student contact hours.
> Arts and Sciences - one for 12 student contact hours.
> Adult non-credit - not necessary.

The above credit hour ratios to student contact hours would cause one FTEE to be the basis for 45 credit hours in the vocational and the arts and sciences divisions.

If term headcount and student classification data are necessary for the Department of Public Instruction and community college's MIS, such reporting should continue to be done based on the headcount enrollment at the end of the second week of the term in vocational and arts and sciences programs and after the second session of short-term courses.

The fourth recommendation was that the funding model for the distribution of state general aid among Iowa's community colleges should be cost-based program funding accompanied by minimum production guidelines to encourage program relevancy, cost efficiency, and accountability.

Programs and courses of study vary significantly in cost. The funding model must allow for varying funding rates so that the need for

internal college fund manipulation is kept at a minimum. Cost centers should be identified which consist of clusters of programs with similar costs. Additional research beyond this study needs to be carried out by another researcher to group the 135 plus program cost centers used in FY 1979 into ten or fewer cost centers. However, cost center identification could resemble the following:

Arts and Sciences

1. All general transfer and preprofessional.
2. All career option programs.

Vocational

1. Agriculture and Health Occupations.
2. Distribution, Marketing, and Office Occupations.
3. Industrial Education.
4. Technical Education.

Adult Education

1. Adult Basic Education, High School completion, general non-credit self-improvement, Vocational supplemental, and Vocational short-term preparatory.
2. Avocational.
3. Community service.

With the cost-based program funding model, production standards are important. Program costs are closely related to classroom and out-of-classroom staff costs. Teacher FTEE ratios should average one to 20 in the arts and sciences and one to 15 in vocational programs. Because of the lower salaries of part-time instructors, adult education should maintain an average teacher-student ratio of one to ten.

Programs and courses of study in the vocational and arts and sciences divisions should be evaluated every fourth year. Enrollment should be one of several significant criterion, and it should be averaged by program using the FTEE generated for the previous biennium and the first half of the second biennium. For any program which would not average at least 80 percent of the production goal, considering all reasons including attrition and registrations, a college would be required to submit to the Department of Public Instruction a written action plan and timeline which would describe the problems the program has had based on an approved assessment procedure and the steps which would be taken to bring production up to minimum standards.

The four year period of time covered by the program evaluation and the cost center structure, which would consist of several programs, should give each individual community college a considerable amount of flexibility and autonomy to operate programs based on cost center averages rather than program by program.

The Iowa Legislature should consider certain principles when financing Iowa's community colleges. Garms (1977, Pages 38-40) identified the following as paraphrased below. Community college financing should:

1. enhance the ability to serve those who find access to traditional institutions difficult.
2. enhance the ability to provide courses and programs insufficiently provided by other institutions.
3. enhance the ability to respond to particular needs of the community and state.
4. be kept within the bounds of public willingness to support them.
5. help prevent wasteful duplication.
6. encourage cost efficient programs.

7. provide equity to students.

8. provide equity to taxpayers.

In addition to the eight principles taken from Garms, maintain strong local autonomy should be added.

A reliable procedure for determining accurate program costs was imperative to calculate accurate FTEE costs. The following procedures were recommended.

1. An appropriate share of indirect costs should be assigned to each program. The procedure used by the Florida community college system was a good model to follow (See Appendix K).

2. An appropriate share of the direct costs should also be assigned to each program. Again, the procedure used by the Florida community college system was a good model to follow (See Appendix K).

3. One change needed to be made in the Iowa community college definition of direct costs. Direct costs of a program should include equipment depreciation. All equipment should be placed on a depreciation schedule and charged to the program on an annual basis. Again, the Florida community college system was a good model (See Appendix K).

An adequate system of financing Iowa's community colleges would include the following components:

1. The present .20¼ cents levy per $1,000 of assessed property valuation of the merged area should be continued for both general operations and capital outlay.

2. A new taxing authority should be granted to the merged area community college board to levy a program enrichment tax of one mill or less to support instructional efforts, such as developmental courses for low achievers and opportunities for gifted students.

3. There should be a standard base tuition for all Iowa community colleges with the flexibility to exceed that base by not more than 20 percent without losing the effect in succeeding budget periods.

4. Regular federal vocational aid should be prorated to vocational programs on an equal basis. Programs funded entirely by federal grants should be kept apart from the general operations of the college.

5. State general aid should be allocated to complete the income for Iowa's community colleges. It should be calculated and distributed as follows:

   a. The program cost center base year should remain the base year for three consecutive years before being updated. Adjustments to this cost center budget should be made annually from the base budget figure.

   b. Community colleges should be guaranteed full funding for all units of production but should be made aware of the philosophy of the state toward overproduction or production limits.

   c. An average indirect cost rate per FTEE should be determined based on all programs operated in the state. Each college should be reimbursed for indirect expenses according to the state average per FTEE. The Texas community college system was a good model (See Appendix L). Each college should receive an amount equal to the state average, multiplied by the number of FTEE produced.

   d. The actual direct cost per FTEE of each program cluster cost center should be multiplied by the number of FTEE produced in each cost center in each college.

      Each college should receive state general aid for the difference between the total cost of indirect and direct expenses as calculated above and the income received from the .20¼ cent levy only, regular base tuition only, and federal vocational aid.

   e. New program growth money should be furnished by the state and should be allocated to schools who have approved programs ready to implement.

The last significant factor to be considered in financing Iowa's community colleges was the approach to the legislature to secure funds for budgetary adjustments for succeeding years.

To calculate an accurate and realistic amount for community college budget increases from one year to the next to allow the colleges to maintain their present status required that the budget be analyzed by budget categories. To assume that a general percentage increase based on total budget would balance out in the end has proven ineffective during past years.

The total Iowa community college expenditures should be categorized as follows:

1. Salaries
2. Contractual services
3. Materials, supplies, and travel
4. Other current expenses

An appropriate rate of increase should be calculated for each category based on the inflationary impact on those categorical expenditures during the previous year.

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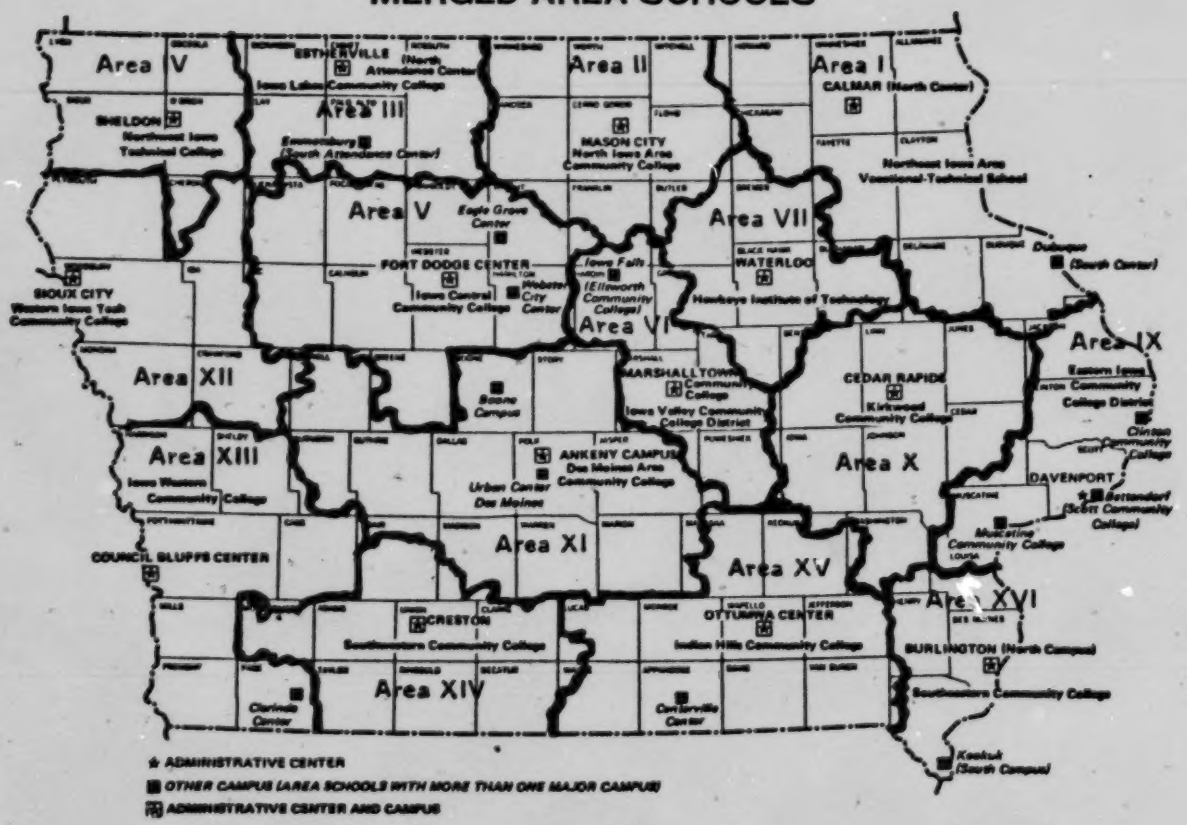
APPENDIX A

Map of Iowa Designating Fifteen Areas
Served by Area Community Colleges



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APPENDIX B

IV. CONCERNS IDENTIFIED BY THE LACTS COMMITTEE

Charles Moench reviewed some concerns which have arisen in connection with the lack of adequate transcript keys on some area school transcripts.

It was moved by Hawse and seconded by Larson that the DPI schedule, a Telenetwork meeting which includes the Registrar of each Area School, during which time an explanation of the problem situation will be made by Ron Napier of Kirkwood Community College, and an opportunity provided for each Area School to determine what, if any, changes need to be made in the institution's transcript key.

Ayes: All
Nays: None

V. F.T.E.E. STUDY COMMITTEE

Charles Moench indicated a need for the formation of an Ad Hoc Committee to study the formula presently being used to determine F.T.E.E. He recommended the minimum representation should be two Registrars, one representative from each of the three instructional divisions and a representative from the DPI.

Discussion indicated general agreement to the recommendation and that a representative from the Business Officers should be added to the committee. President Smith then asked for recommendations as to committee membership. The following names were accepted by President Smith as those who would serve.

Area I	Darwin Schrage	Career Education
Area III	Gene Schorzmann	Arts and Science
Area V	Harvey Martin	Enrollment Reporting Officers
Area VI	Verle Stucker	
Area VII	George Bennett	Adult Education
Area XI	Leonard Bengtson	Enrollment Reporting Officers
Area XIII	Wayne Rudolph	Research and Development Officers
Area XVI	Bill Gehrmann	Business Managers
DPI	Doug Reynolds	Student Services Consultant

VI. IOWA COORDINATING COUNCIL FOR POST-HIGH SCHOOL EDUCATION PROPOSED COOPERATIVE STATEMENT

Charles Moench reviewed the development and purpose of the Proposed Cooperative Statement and indicated that the Iowa Coordinating Council for Post-High School Education would likely be considering this statement for adoption at the February meeting. He indicated a need for reaction to same from the Merged Area School Superintendents in order that representatives would know how to vote on the issue at the Council meeting.

APPENDIX C

STATE OF IOWA • DEPARTMENT OF PUBLIC INSTRUCTION
GRIMES STATE OFFICE BUILDING • DES MOINES, IOWA 50319

Iowa
a place to grow

ROBERT D. BENTON, Ed.D., STATE SUPERINTENDENT
David H. Bechtel, M. S., Administrative Assistant
JAMES E MITCHELL, Ph.D., DEPUTY SUPERINTENDENT

DATE: June 26, 1978

TO: FTEE Review Committee

FROM: Doug Reynolds, Chairperson

SUBJECT: Minutes of June 20th FTEE Review Committee Tele-Network Meeting

The meeting covered three topical areas: 1) current problems; 2) alternative procedures; 3) future committee action.

1) Problems:

a) Amount of resources (people/money) it takes to compute the data relative to reimbursements; hand tabulations.

b) Formula is too complex; therefore, it is too time consuming.

c) Time for reporting enrollments is inappropriate. It would be more realistic to report enrollments after two weeks into the quarter.

d) Differences between reporting A & S - vs - Voc. Tech is difficult to understand.

e) Standardization of FTEE reimbursables may affect content.

f) No Problem! DPI is the approval agent for programs. DPI is responsible for determining whether FTEE is fairly reimbursed or whether they are being manipulated.

g) Percentage of lab/lecture hours should be assigned according tc the taxonomy listing.

h) Adult Education has guidelines for FTEE. Where are A & S and Voc. Tech in guidelines development?

i) Guidelines for FTEE might insite interest in standards for other cost variable areas.

j) Standard definition for lab/lecture hours.

k) Awareness of how each college applies the formula to their reimbursement areas.

l) Appropriations funding formula relies too heavily on the FTEE computation process or formula.

m) Guidelines for FTEE formula needed.

STATE OF IOWA • DEPARTMENT OF PUBLIC INSTRUCTION
GRIMES STATE OFFICE BUILDING • DES MOINES, IOWA 50319

Iowa
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ROBERT D. BENTON, Ed.D., STATE SUPERINTENDENT
David H. Bechtel, M. S., Administrative Assistant
JAMES E. MITCHELL, Ph.D., DEPUTY SUPERINTENDENT

DATE: August 18, 1978

TO: FTEE Review Committee

FROM: Area Schools Division

SUBJECT: Impact of Changing Program Structure on FTEE

We in the State Educational Agency have been increasingly concerned about changes in area school programs that have an impact on FTEE reporting. These changes frequently result in considerable reductions in the number of laboratory hours in programs where no major change occurs as far as program objective or program length. The end result of these changes is an obvious increase in the number of FTEE manufactured within such a program that has changed. An example of this type of change is one that recently came to our attention. Without making any effort to identify the school or the particular program to avoid possible embarrassment, we would like to provide the following information.

Program as Initially Offered

Total Lecture Contact Hrs.	Total In-Sch. Lab Hours	Total Coop/Clinical Lab Hours	Quarter Credit Hrs.
401	499	610	68

Program as Amended

Total Lecture Contact Hrs.	Total In-Sch. Lab Hours	Total Coop/Clinical Lab Hours	Quarter Credit Hrs.
930	-0-	560	92

The program as initially approved resulted in a total of 955.5 reimbursable hours for each student. This total was obtained by dividing the contact hours by one and the in-school lab and the coop/clinical lab contact hours by two. The revised program will provide 1,210 reimbursable hours. The difference in FTEE generated by this change is quite substantial. The initial program resulted in a total of 1.77 FTEE for each individual enrolled and the revised program will result in a total of 2.24 FTEE for each individual enrolled. The net difference is a gain of .47 FTEE for each student enrolled.

We do not feel that this type of revision improves area school credibility in accounting for students. It is not the intent of this memorandum to suggest that the State Educational Agency is the only agency that can decide on how to best teach a preparatory career program relative to the division of teaching experiences, lecture, laboratory, and coop/clinical. However, it now appears quite obvious that we must now deal directly with this potential problem situation before the credibility of our enrollment reporting is completely lost. There certainly can be little justification for developing program changes that result in increasingly greater FTEE when the amount of total time in the program is not significantly altered or the objective of the program.

We also would like to call to your attention the number of quarter credit hours generated by this program. Although we do not utilize credit hours in computing FTEE, we also believe there should be some reasonable rationale for determining how many credits are awarded in a program. This change increases the quarter credit hours for this program from 68 to 92. The net result is a one year program that has approximately the same number of quarter credit hours that are normally required for an associate in arts degree.

We hope you will review this matter carefully and we will be pleased to provide additional information that you may require. We strongly feel that some leadership will need to be provided in improving credibility of FTEE prior to the beginning of a new fiscal year.

Sincerely,

Charles R. Moench, Director
Area Schools Division

CRM:drr

cc: Merged Area School Superintendents

APPENDIX E

MIS Definitions

Student Credit Hours

Full-Time Student

Part-Time Student

Formula for SFTE

Section One

1975 MIS

DEFINITIONS FROM REPORTING STATES

STUDENT CREDIT HOURS

Alabama:	Number of hours the student is taking for credit at the institution.
Arizona:	Total of all credit hours for courses attempted.
Arkansas:	One hour of lecture for 16-18 weeks.
California:	No less than 16 student contact hours for each credit hour.
Connecticut:	One semester hour equals one hour per week in class--lecture, discussion, quiz periods. For laboratory sessions--one lab hour equals one-half to two-thirds credit hour.
Delaware:	One class hour of lecture-demonstration or three lab or clinic hours per week per quarter equals one credit hour. One student times one credit hour equals one student credit hour.
Florida:	One classroom contact hour equals one student credit hour.
Georgia:	One credit hour measures student activity in course work for one hour of class time per week for an academic quarter (12 weeks).
Hawaii:	Sum of semester hours taken by all students registered in all classes, excluding auditors. Example: 75 student credit hours, taken by 25 students in lecture section 39 of English 100 (3 credits).
Illinois:	50 class time minutes x 10 for quarter credit hours. (Total 500 min.) and x 15 for semester credit (total 750 minutes).
Iowa:	Each clock hour a student is in an officially scheduled class session for which he is duly registered.

STUDENT CREDIT HOURS (cont.)

Kansas:	One (1) hour of instruction per week for 18 weeks or its equivalent.
Kentucky:	One student credit hour equals one 50 minute lecture recitation per week.
Massachusetts:	One class meeting (50 min.) per week for 14-15 weeks.
Minnesota:	Minimum of one hour per week for 11 weeks in a class or other organized learning experience.
Mississippi:	Not defined by law (semester hour - minimum of 750 minutes lecture or equivalent).
Montana:	One credit hour is usually assigned a class that meets 50 minutes a week for a quarter or total student credit hours are determined by multiplying the credit hour value of a course by the number of students registered in the course.
Nevada:	One (1) hour of lecture x 15 weeks of instruction = one credit. Three (3) lab hours per week x 15 weeks = one credit.
New Jersey:	Federal HEGIS definition.
New York:	The number of academic units assigned to a credit course.
Nevada:	One credit per semester hour = 15 hours lecture, or 45 hours of lab.
Ohio:	One student engaged in activity for which one hour of credit toward a degree or other certificate will be granted upon successful completion.
Oklahoma:	One hour class for a minimum of 16 weeks.
Oregon:	"Term Hour" means a 50 minute period of course work a week per student for approximately one-third of a school year.
Pennsylvania:	One credit equals 45 contact hours per semester.
Rhode Island:	Each course and lab carries a credit-hour equivalent determined by the appropriate Curriculum Committee upon recommendation by the department involved.
South Carolina:	The sum total of all credits for which students are enrolled in a given quarter.

STUDENT CREDIT HOURS (cont.)

Tennessee:	Number of students times the credit hours of the course taken.
Virginia:	Credit value of course times student enrollment in course.
Washington:	Course section enrollment times the quarterly credit hour value (or equivalent for non-credit classes) of the respective course section.
West Virginia:	Student enrollment times course credit.
Wisconsin:	One credit for three hours of study per week, whether in classroom, laboratory, assigned outside study, or any combination thereof.
Wyoming:	Not formalized.

FULL-TIME STUDENT

Alabama:	12 or more hours.
Arizona:	12 or more credit hours.
Arkansas:	One that enrolls for at least 12 semester hours when headcount is determined.
California:	Enrolled in 12 or more credit hours for the semester or quarter.
Connecticut:	Any student enrolled for 12 or more semester hours in any one semester.
Delaware:	Students carrying at least 3/4 or normal load, e.g., 12 credit hours or more.
Florida:	Student taking 12 hours or more per term.
Georgia:	One registered for course credits equal to at least 75 percent of a normal student load.
Hawaii:	12 or more credits per semester at the same institution.
Illinois:	A student taking 12 or more semester or quarter hours per regular academic term (at the census date of the regular term).
Iowa:	A full-time student shall be defined as one who is taking 12 or more hours of college credit or the equivalent.
Kansas:	No definition.
Kentucky:	12 or more student credit hours per semester (six during summer session).
Massachusetts:	Any student who is taking 15 or more credit hours of course work per semester.
Minnesota:	A student enrolled for 12 or more quarter credits.
Mississippi:	12 or more semester hours per semester (or 450 clock hours for vocational students).
Montana:	One taking 12 or more credits.
Nevada:	Student enrolled for sixteen (16) credits or more per semester.

FULL-TIME STUDENT (cont.)

New Jersey:	12 or more credit hours per semester.
New York:	Those enrolled for 12 or more credit hours.
Ohio:	12 or more credit hours.
Oklahoma:	A student who is enrolled in 15 or more semester credit hours. (12 for veterans)
Oregon:	A student carrying at least 15 term hours or 20 clock hours per week for those terms of not less than ten weeks each.
Pennsylvania:	12 or more credits per semester.
Rhode Island:	One carrying 12 or more credit hour equivalents.
South Carolina:	12 or more credit hours.
Tennessee:	A full-time student is defined as one enrolled for 12 or more hours of on-campus or resident work.
Virginia:	Student carrying 12 or more credits per quarter.
Washington:	Any student enrolled for more than ten quarterly credit hours.
West Virginia:	Student enrolled for credits equal to at least 75 percent of normal full-time load. (15 hours)
Wisconsin:	One who attains 80 percent or more of FTE load.
Wyoming:	An individual registered for 12 or more credits per term.

PART-TIME STUDENT

Alabama:	11 or less hours.
Arizona:	Less than 12 credit hours.
Arkansas:	One that enrolls for less than 12 semester hours.
California:	Enrolled in less than 12 credit hours.
Connecticut:	Any student enrolled for less than 12 semester hours in any one semester.
Delaware:	Students carrying less than 3/4 of normal load, e.g., 11 credit hours or less.
Florida:	Student taking 11 hours or less per term.
Georgia:	Less than 75 percent of normal student load.
Hawaii:	Less than 12 credits at the same institution.
Illinois:	A student enrolled in less than 12 semester or quarter credit hours per regular academic term.
Iowa:	A student in a college parallel division who is taking less than 12 hours of college credit or the equivalent.
Kansas:	No definition.
Kentucky:	Less than 12 hours per semester (5 or less during summer).
Massachusetts:	Any student who is taking less than 15 credit hours of course work per semester.
Minnesota:	A student enrolled for 11 or less credits.
Mississippi:	Less than 12 semester hours per semester (or less than 450 clock hours for occupational student).
Montana:	Less than 12 semester credits.
Nevada:	Student enrolled for less than 16 credits per semester.
New Jersey:	Less than 12 credit hours.
New York:	Those enrolled for one to 11 credit hours.

PART-TIME STUDENT (cont.)

Ohio:	Less than 12 credit hours.
Oklahoma:	A student who is enrolled in 11 or less semester credit hours.
Oregon:	A student carrying less than 15 term hours or 20 clock hours per week.
Pennsylvania:	Less than 12 credits per semester.
Rhode Island:	One carrying less than 12 credit hour equivalents.
South Carolina:	Less than 12 credit hours.
Tennessee:	A part-time student is defined as one enrolled for less than 12 hours of on-campus or resident work for credit.
Virginia:	Student carrying less than 12 hours per quarter.
Washington:	Any student enrolled for less than ten quarterly credit hours.
West Virginia:	Less than 75 percent of the normal full-time load. (15 hours)
Wisconsin:	Less than 80 percent of FTE load.
Wyoming:	An individual registered for less than 12 credits per term.

FORMULA FOR STUDENT FTE

Alabama:	12 to 21 hours counts as one FTE. All part-time students' credit hours are added up and divided by 12. These two figures are then added together.
Arizona:	Total student credit hours divided by 15.
Arkansas:	Total number of student semester credit hours enrolled on 11th class day for each semester divided by 15 or divided by 30 for one year.
California:	Unit of average daily attendance based on 525 contact hours for the academic year.
Connecticut:	F.T. + 40% P.T. = FTE
Delaware:	16 student contact hours per week equals one FTE.
Florida:	Total credit hours divided by 15 for a given term; total credit hours divided by 30 for annual FTE.
Georgia:	Per academic quarter or accumulation thereof, $\text{Student FTE} = \frac{\text{SCH}}{16.67}$
Hawaii:	Total student credit hours taken divided by 15 credit hours.
Illinois:	The statistical student unit calculated by dividing all credit hours generated at the college by 15 credit hours for any term to determine the annual FTE students. Divide all credit hours for that year by 30 semester hours for colleges on the semester system and by 45 quarter hours for colleges on the quarter calendar.
Iowa:	N/A
Kansas:	The total number of credit hours generated divided by 15 (hrs.) = student FTE per semester.
Kentucky:	Total student credit hours divided by 15 = FTE per semester.
Massachusetts:	Total full-time students plus total credits of part-time students divided by 15.
Minnesota:	For each quarter--FTE = number of credits divided by 15. For the academic year--FTE = number of credits divided by 45.

FORMULA FOR STUDENT FTE (cont.)

Mississippi:	Full-time students plus equivalent of part-time (usually: part-time divided by 2.5).
Montana:	Total student credit hours divided by 15.
Nevada:	Total student credit hours divided by 16 semester hours of credit.
New Jersey:	Full-time headcount plus part-time total credit hours divided by 15 (30 for annual figures).
New York:	Annual average FTE workload - total student credit hours produced in all terms plus equivalent credit hours produced in some non-credit courses minus credit hours produced in self-supporting contract courses divided by 30 for semester system colleges and 45 for quarter system colleges.
North Carolina:	
Ohio:	Total fall quarter hours divided by 15.
Oklahoma:	Total semester credit hours in which all students are enrolled divided by 15 equals number of FTE for that enrollment period.
Oregon:	Total credits divided by 45.
Pennsylvania:	Full-time + (total part-time credits divided by 12).
Rhode Island:	Total credit-hour equivalents divided by 15.
South Carolina:	45 quarterly credits equal one annual FTE. 15 quarterly credits equal one FTE per quarter.
Tennessee:	$\frac{\text{Total Student Credit Hours}}{15}$
Virginia:	Student credit hours divided by 15 equals FTE (quarter system).
Washington:	Total quarterly student credit hours divided by 15.
West Virginia:	Student credit hours per semester divided by 15.
Wisconsin:	Annual--credits divided by 30 for credit courses; hours divided by 810 for hour courses.
Wyoming:	It is computed for a term by dividing the sum of the student credits by 12.

APPENDIX F

IOWA AREA COMMUNITY COLLEGE VOCATIONAL PROGRAM ANALYSIS
Equivalent Enrollment Computational Procedures
Resulting In Percent Of Reimbursable
Contact Hours Claimed

Merged Area	Taxonomy Number	Program Title	Total Contact Hours	Lecture Contact Hours	% of Total Contacts	Lab Contact Hours	% of Contact Hours	Coop Contact Hours	% of Total Contacts	Total Reimbursable Contact Hours	% of Total Contacts
I											
II											
III											
IV											
V											
VI											
VII											
IX											
X											
XI											
XII											
XIII											
XIV											
XV											
XVI											

Mean_____ Range_____

APPENDIX G

IOWA AREA COMMUNITY COLLEGE VOCATIONAL PROGRAM ANALYSIS
By College By Ten Digit Taxonomy Showing Range And
Mean Converted to Percents of Reimbursable
Contact Hours

Merged Area _____

Number of Programs _____

Taxonomy	Program Title	Range in Percent of RCH Claimed low high	Mean Percent of RCH by Program Taxonomy in all Colleges	Percent that RCH are of Total Contacts by Program by College

APPENDIX H

IOWA AREA COMMUNITY COLLEGE VOCATIONAL PROGRAM ANALYSIS
By Ten Digit Taxonomy Showing Number of Sections, Full-Time Equivalent Enrollments Generated In The Schools With Highest and Lowest Percents, The Cost Per Contact Hour, And Cost Per FTEE In Those Schools

Taxonomy	Program Title	No. of Sections of Programs	FTEE Generated In		Cost Per Contact Hour			FTEE Cost		
			College With Lowest Percent	College With Highest Percent	College With Lowest Percent	College With Highest Percent	Mean Percent	College With Lowest Percent	College With Highest Percent	Mean Cost

APPENDIX I

IOWA AREA COMMUNITY COLLEGE VOCATIONAL PROGRAM ANALYSIS

Analysis Showing The Effects On FTEE Generated And Their
Costs When Applying The Current Calculation
Procedures By Program Taxonomy
In FY 1977

Program Taxonomy					
Program Title					
Present percent of RCH in college with lowest percent					
Present percent of RCH in college with highest percent					
Mean percent of RCH from all Iowa area colleges					
FTEE generated in college with lowest percent of RCH					
FTEE generated in the college with lowest percent of RCH if the percent from the highest were applied					
FTEE generated in the college with lowest percent of RCH if the mean percent from all colleges were applied					
FTEE generated in college with highest percent of RCH					
FTEE generated in the college with highest percent of RCH if the percent from the lowest were applied					
FTEE generated in the college with highest percent of RCH if the mean percent from all colleges were applied					
Cost of FTEE in the college with lowest percent of RCH					
Cost of FTEE in the college with lowest percent of RCH if the percent from the college with the highest were applied					
Cost of FTEE in the college with lowest percent of RCH if the mean percent from all colleges were applied					
Cost of FTEE in the college with highest percent of RCH					
Cost of FTEE in the college with highest percent of RCH if the percent from the college with the lowest were applied					
Cost of FTEE in the college with highest percent of RCH if the mean percent from all colleges were applied					

APPENDIX J

Results of Duncan Multiple Range Test

Colleges Compared		M1	M2	Difference Between Means	Critical Differences	Significant At .05 Level
4	9	67.1375	68.4886	1.3511	3.3563	No
4	12	67.1375	68.7114	1.5739	3.5380	No
4	5	67.1375	68.7536	1.6161	3.6592	No
4	6	67.1375	69.3545	2.2170	3.7440	No
4	10	67.1375	70.1508	3.0133	3.8167	No
4	2	67.1375	70.3650	3.2275	3.8652	No
4	7	67.1375	70.6927	3.5552	3.9136	No
4	16	67.1375	71.0130	3.8755	3.9500	No
4	1	67.1375	71.1583	4.0208	3.9863	Yes
4	3	67.1375	71.5263	4.3888	4.0106	Yes
4	14	67.1375	71.7143	4.5768	4.0469	Yes
4	13	67.1375	71.8194	4.6819	4.0712	Yes
4	15	67.1375	72.4394	5.3019	4.0954	Yes
4	11	67.1375	76.5043	9.3668	4.1196	Yes
9	12	68.4886	68.7114	0.2228	3.3563	No
9	5	68.4886	68.7536	0.2650	3.5380	No
9	6	68.4886	69.3545	0.8660	3.6592	No
9	10	68.4886	70.1508	1.6622	3.7440	No
9	2	68.4886	70.3650	1.8764	3.8167	No
9	7	68.4886	70.6927	2.2041	3.8652	No
9	16	68.4886	71.0130	2.5245	3.9136	No
9	1	68.4886	71.1583	2.6698	3.9500	No
9	3	68.4886	71.5263	3.0377	3.9863	No
9	14	68.4886	71.7143	3.2257	4.0106	No
9	13	68.4886	71.8194	3.3308	4.0469	No
9	15	68.4886	72.4394	3.9508	4.0712	No
9	11	68.4886	76.5043	8.0158	4.0954	Yes
12	5	68.7114	68.7536	0.0422	3.3563	No
12	6	68.7114	69.3545	0.6432	3.5380	No
12	10	68.7114	70.1508	1.4394	3.6592	No

Results of Duncan Multiple Range Test

Colleges Compared		M1	M2	Difference Between Means	Critical Differences	Significant At .05 Level
12	2	68.7114	70.3650	1.6536	3.7440	No
12	7	68.7114	70.6927	1.9813	3.8167	No
12	16	68.7114	71.0130	2.3017	3.8642	No
12	1	68.7114	71.1583	2.4470	3.9136	No
12	3	68.7114	71.5263	2.8150	3.9500	No
12	14	68.7114	71.7143	3.0029	3.9863	No
12	13	68.7114	71.8194	3.1080	4.0106	No
12	15	68.7114	72.4394	3.7280	4.0469	No
12	11	68.7114	76.5043	7.7930	4.0712	Yes
5	6	68.7536	69.3545	0.6010	3.3563	No
5	10	68.7536	70.1508	1.3972	3.5380	No
5	2	68.7536	70.3650	1.6114	3.6592	No
5	7	68.7536	70.6927	1.9391	3.7440	No
5	16	68.7536	71.0130	2.2595	3.8167	No
5	1	68.7536	71.1583	2.4048	3.8652	No
5	3	68.7536	71.5263	2.7727	3.9136	No
5	14	68.7536	71.7143	2.9607	3.9500	No
5	13	68.7536	71.8194	3.0658	3.9863	No
5	15	68.7536	72.4394	3.6858	4.0106	No
5	11	68.7536	76.5043	7.7508	4.0469	Yes
6	10	69.3545	70.1508	0.7962	3.3563	No
6	2	69.3545	70.3650	1.0105	3.5380	No
6	7	69.3545	70.6927	1.3381	3.6592	No
6	16	69.3545	71.0130	1.6585	3.7440	No
6	1	69.3545	71.1583	1.8038	3.8167	No
6	3	69.3545	71.5263	2.1718	3.8652	No
6	14	69.3545	71.7143	2.3597	3.9136	No
6	13	69.3545	71.8194	2.4648	3.9500	No
6	15	69.3545	72.4394	3.0848	3.9863	No
6	11	69.3545	76.5043	7.1498	4.0106	Yes

Results of Duncan Multiple Range Test

Colleges Compared		M1	M2	Difference Between Means	Critical Differences	Significant At .05 Level
10	2	70.1508	70.3650	0.2142	3.3563	No
10	7	70.1508	70.6927	0.5419	3.5380	No
10	16	70.1508	71.0130	0.8623	3.6592	No
10	1	70.1508	71.1593	1.0076	3.7440	No
10	3	70.1508	71.5263	1.3755	3.8167	No
10	14	70.1508	71.7143	1.5635	3.8652	No
10	13	70.1508	71.8194	1.6686	3.9136	No
10	15	70.1508	72.4394	2.2886	3.9500	No
10	11	70.1508	76.5043	6.3536	3.9863	Yes
2	7	70.3650	70.6927	0.3277	3.3563	No
2	16	70.3650	71.0130	0.6480	3.5380	No
2	1	70.3650	71.1583	0.7933	3.6592	No
2	3	70.3650	71.5263	1.1613	3.7440	No
2	14	70.3650	71.7143	1.3493	3.8167	No
2	13	70.3650	71.8194	1.4544	3.8652	No
2	15	70.3650	72.4394	2.0744	3.9136	No
2	11	70.3650	76.5043	6.1393	3.9500	Yes
7	16	70.6927	71.0130	0.3204	3.3563	No
7	1	70.6927	71.1583	0.4657	3.5380	No
7	3	70.6927	71.5263	0.8336	3.6592	No
7	14	70.6927	71.7143	1.0216	3.7440	No
7	13	70.6927	71.8194	1.1267	3.8167	No
7	15	70.6927	72.4394	1.7467	3.8652	No
7	11	70.6927	76.5043	5.8117	3.9136	Yes
16	1	71.0130	71.1583	0.1453	3.3563	No
16	3	71.0130	71.5263	0.5133	3.5380	No
16	14	71.0130	71.7143	0.7012	3.6592	No
16	13	71.0130	71.8194	0.8063	3.7440	No
16	15	71.0130	72.4394	1.4264	3.8167	No

Results of Duncan Multiple Range Test

Colleges Compared		M1	M2	Difference Between Means	Critical Differences	Significant At .05 Level
16	11	71.0130	76.5043	5.4913	3.8652	Yes
1	3	71.1583	71.5263	0.3680	3.3563	No
1	14	71.1583	71.7143	0.5560	3.5380	No
1	13	71.1583	71.8194	0.6610	3.6592	No
1	15	71.1583	72.4394	1.2811	3.7440	No
1	11	71.1583	76.5043	5.3460	3.8167	Yes
3	14	71.5263	71.7143	0.1880	3.3563	No
3	13	71.5263	71.8194	0.2930	3.5380	No
3	15	71.5263	72.4394	0.9131	3.6592	No
3	11	71.5263	76.5043	4.9780	3.7440	Yes
14	13	71.7143	71.8194	0.1051	3.3563	No
14	15	71.7143	72.4394	0.7251	3.5380	No
14	11	71.7143	76.5043	4.7901	3.6592	Yes
13	15	71.8194	72.4394	0.6200	3.3563	No
13	11	71.8194	76.5043	4.6850	3.5380	Yes
15	11	72.4394	76.5043	4.0650	3.3563	Yes

APPENDIX K

Summary of the Unit of Measurement and Funding Methodology Used by the Florida Community Colleges

The unit of measurement used in the Florida community college system to measure production was the semester credit hour. One semester credit hour consists of 27 clock hours of instruction. An FTEE is equivalent to 30 credit hours or 810 clock hours. All educational programs were divided into four categories which will be described later. Formal training programs were classified as either transfer credit or nontransfer credit programs. Two assumptions were made regarding transfer credit programs. The first assumption was that faculty teaching in transfer credit programs should teach fewer clock hours because such classes result in requiring more preparatory effort than do nontransfer credit programs. The second assumption was that transfer credit students need to put more time in preparation than do students in nontransfer programs.

As a result of these assumptions, 27 contact hours are required for each credit hour in the nontransfer credit program while only from 15 to 17 clock hours on an average are required for each semester credit in transfer credit programs. The semester credits generated by the transfer credit programs and the nontransfer credit programs are both considered to have been generated through 27 contact hours of instruction. The only difference was that part of the 27 clock hours in the transfer credit programs was generated through student study time outside of the class, perhaps in the library or at home.

Instructor contact hour loads in the transfer programs averaged approximately 17 contact hours per week. Instructor loads in the non-

transfer programs consisted of approximately 22 contact hours per week.

The funding methodology in the Florida community college system contained the following characteristics. Community colleges were designated as small or large schools. Schools with fewer than 1300 FTEE's were considered in the small category. FTEE earned in the smaller schools were reimbursed at a higher rate than in the larger schools because they operate less effficiently due to smaller class sizes.

For both the small and the large schools, the average cost per FTEE by program discipline was determined. Each school in each category received the same amount of state aid in programs of identical taxonomy.

There was some minor flexibility in the amount of tuition that could be generated by a local district. A tuition range was set by the Florida legislature and local school boards were allowed to charge slightly higher tuition rates for program enhancement purposes.

Florida had no local tax levy support.

The amount awarded to a school in the form of state general aid, based upon its school size, was the main consideration given to small schools. With that exception, colleges had to live within their incomes. The result was that because approximately 75 to 85 percent of the budget went into salaries, there was a significant difference in the level of salaries paid between community colleges.

The Florida Department of Education (1978) issued a full cost summary report for fiscal 1977 of the Florida community college system. The state of Florida furnished state aid to community colleges based upon the average cost of FTEE in each of 34 disciplines. The 34 disciplines were divided into four categories and included the following:

Category 1: Advanced and Professional

1. agricultural and natural resources
2. architecture and environmental
3. area studies
4. biological sciences
5. business and management
6. communications
7. computer information and science
8. education
9. engineering
10. fine and applied arts
11. foreign languages
12. health professions
13. home economics
14. law
15. letters
17. library science
18. mathematics
19. physical science
20. psychology
21. public affairs
22. social sciences
23. interdisciplinary studies

Category 2: Occupational

1. agriculture
2. distributive
3. health
4. home economics
5. office
6. trade and industrial
7. technical

Category 3: Developmental

1. compensatory
2. adult, elementary, and secondary

Category 4: Community Instructional Services

1. citizenship
2. avocational

SECTION 6

COST ANALYSIS

Introduction

This section describes the system for the analysis of operating expenditures of Florida community colleges. The system provides uniform procedures, definitions, and report forms to be used by each college to develop, analyze, and report cost information.

Objectives

The system for analysis of the operating expenditures of Florida community colleges is designed to show the cost of providing instruction for each individual course and for various levels of course aggregations. All courses and their associated costs are included in the analysis regardless of the source of revenues which support them. The system identifies the components of cost according to two basic parameters:

A. The type of expenditures; i.e., personnel expenditures, supplies and service expenditures, and equipment expenditures.

B. The purpose of the expenditures; i.e., instructional salaries, departmental expenditures, and support program expenditures.

The information developed by this system can be used for the following purposes:

A. To aid college administrators in making resource allocation and programming decisions,

B. To conduct comparative cost studies,

C. To develop and support requests for funds from the State Legislature,

D. To allocate funds to individual colleges,

E. To make long-range cost projections.

General Principles and Definitions

The following general principles should be applied uniformly by colleges when conducting the cost analysis:

A. Expenditures included in the analysis are those recorded in the General Current (Fund 1) and Restricted Current (Fund 2) funds with the exception of fee waivers recorded as expenditures in Accounts 598 and 680 and certain non-program expenditures (see CA-1). It also includes the expenditures

from accounts 710-Furniture and Equipment and 730-Library Books and Films recorded in Fund 7, the Unexpended Plant Fund.

B. The analysis includes all courses which began in the ACADEMIC YEAR. The instructional personnel expenditures associated with conducting these courses are included in the analysis for the academic year in which the courses were taught. All other expenditures (other personnel expenditures, current expense, and capital outlay) are taken for the FISCAL YEAR. In other words, all expenditures made to persons for conducting instructional activities (courses) are assigned to the courses they taught. Thus, an adjustment must be made if the expenditure was made in another fiscal year (See Report CA-1).

C. The unit for measurement of production is the semester credit (SC) and semester credit equivalent (non-credit courses). The credit equivalent is computed by dividing the total number of instructional hours in non-credit courses by 27. Semester credit and equivalencies are converted to annualized full-time equivalent units (FTE) by dividing the total number by 30.

D. There are two basic formats for developing and displaying cost data:

1. Direct costs are those associated with conducting activities classified according to the principles and definitions in the Community College Information Classification Structure (ICS).

   Report CA-2 shows the cost centers for which direct costs are to be reported. Direct costs are defined in this analysis as those which can be directly related to conducting an activity or a set of activities defined in the ICS.

2. Full costs are those related to producing a specific quantity of output. In this analysis, full costing is accomplished for instructional programs only. The assumption is that instruction is the production function of the Florida community colleges. Support costs are allocated to instructional cost centers based on "charge back" procedures or semester credit ratios. (See paragraph I below.) Full costs displayed in Report CA-3 are shown for each course offered by the college with summary costs for each level of aggregation.

E. The cost components for each cost center are as follows:

1. Personnel Expenditures - Includes personnel benefits as well as all other expenditures for personnel services. (See 500 series of accounts in Section 2 of Accounting Manual). (Tuition Waivers, Account 598, are excluded).

A. Instructional
B. Executive, Administrative, Managerial
C. Professional/Specialist
D. Support

(For definitions of these categories, see instructions for Report CA-2).

2. Supplies and Services Expenditures - Current Expense and Minor Equipment Account 705.

3. Equipment - Type 1, annual expenditures for equipment.
Type 2, depreciation on equipment.

F. Distribution of Personnel Expenditures - The distribution of personnel expenditures and assignments is based on the principles found in Workform A - Personnel Assignments. The output of the system is the FTE positions and the personnel expenditures distributed to the cost centers of the ICS.

The following principles apply to the distribution of personnel expenditures and assignments:

1. Personnel expenditures include amounts expended by the college for salaries and employee benefits (e.g., social security, retirement, and insurance contributions).

2. The personnel expenditures and assignments of an individual are distributed to the cost centers and the personnel categories based on each assignment's proportionate share of the individual's total workload.

The following diagram emphasizes the required procedure to distribute personnel assignments (and proportionate dollars) to both personnel categories and ICS categories:

	Personnel Categories			
	Instruction	Exec., Admin., Man.	Professional/ Specialist	Support
ICS Categories	% of Assignment	% of Assignment	X	X
	% of Assignment	X	X	X
	X	X	X	X

3. Instructional personnel expenditures and assignments are distributed to each course on the basis of the number of credit hours or equivalents taught and the percentage of an individuals assignment associated with the instruction function.

The following example illustrates the procedure to be used to distribute instructional personnel expenditures and assignments:

A. Salary = personnel benefits = $15,000
B. Annual full load standard is 42 credit hours (15 Fall term, 15 Winter term, 12 Summer term (6 + 6)

Courses Taught	Discipline	Credit Hours	Expend. Distri.	FTE Posi. Distri.
Bio. 101	1.10.0400 Biol. Sci.	15	$ 6,429	.36
Bio. 211	1.10.0400 Biol. Sci.	8	3,428	.19
Chem. 101	1.10.1900 Phys. Sci.	12	$ 5,143	.29
Annual Total for this instructor		35	$15,000	.84

In this example, each course that the person taught receives a share of the expenditures and FTE positions computed by taking the proportion that his workload was for each course times the total salary and total FTE, respectively.

For persons that have both teaching and non-teaching assignments, the expenditures distributed to the courses and those distributed to the other assignments should be based on a proration of the person's total workload. For example, a department chairman may have the following assignment distribution:

% for teaching equals 40% of the base salary and assignment.

% for department administration is 60% of the base salary and assignment.

Annual salary was $16,000 base plus a $1,000 supplement for department chairman duties.

Distribution:

to courses (teaching) - .4 FTE and $6,400.
to Department Administration - .6 FTE and $10,600
($9,600 Base + $1,000 Supplement)

Note that the salary supplement is charged against the department administration activity and not against the teaching activity. The salary expenditure and FTE is then distributed to the individual courses as shown above.

The same procedure is used to distribute the salary expenditures and assignments of all persons who have multiple assignments including teaching.

4. Personnel expenditures and assignments for non-instructional professional (Executive, Administrative, Managerial and Professional/Specialist) activities are distributed to the ICS cost centers on the basis of a proportionate proration of assignments for an FTE position. Assume a person in the student personnel office, with work assignments in counseling, placement services, and intramural programs, was full-time for 12 months and was paid $12,000 (including personnel benefits). The following illustrates the distribution of personnel expenditures for the person.

Subfunction	Assignment Proportion of FTE Position	Expenditures Distribution
5.30 Counseling	.50	$6,000
5.40 Placement	.30	3,000
5.10 Social and Cultural Development (intramurals)	.20	2,400

5. Personnel expenditures and assignments for support staff activities are distributed to the ICS cost centers using one of the following procedures:

   a. Distribute the expenditures and assignments based on an analysis of the workloads and assignments of each support staff using the procedures described in Workform A - Personnel Assignments.

   b. Distribute the expenditures and assignments in the same proportion as those of the professional staff in the departments in which the support positions are found or in the same proportion as the distribution of student semester hours (in instructional departments).

   The following illustrates the use of Option B to distribute support staff expenditures and assignments:

   The Natural Science Department had the following distribution of professional staff assignments to the disciplines:

Disciplines	Professional FTE Positions	%
Biological Science	10.5	45
Physical Science	11.6	49
Architectural and Environmental Design	1.4	6
TOTAL	23.5	100

   The distribution of two full-time equivalent support positions with a total salary of $14,250 would be as follows:

Discipline	% Distribution	FTE Support Staff	Salary Distrib.
Biological Science	45	.90	$ 6412.50
Physical Science	49	.98	6982.50
Architectural and Environ. Design	6	.12	855.00
TOTAL	100%	2.00	$14250.00

This procedure may also be used for the distribution of support staff expenditures and positions for support departments; e.g., Learning Resources, Student Services, Executive Management, etc.

G. Distribution of Expenditures for Supplies and Services - This is a cost component which includes most of the current expense accounts in the Florida Community College Accounting Manual (Pages 12-3 through 12-9). Account 680, Fee Waivers, is excluded from this part of the analysis.

1. Expenditures for supplies and services of departments should be distributed directly to the ICS cost centers if expenditures can be so identified and documented for audit purposes.

2. Expenditures for supplies and services of instructional departments that cannot be specifically identified with cost centers are distributed on the basis of student credit hours. The following example illustrates the procedure:

Assume you had a Social Science Department with expenditures of $3,000 for supplies and services. The disciplines supported by this department and the student credit hour production were as follows:

Discipline	SCH	%	$ Distributed
1.10.2200 Social Science	7380	70	$2,100
1.10.2000 Psychology	2919	27	810
1.10.0300 Area Studies	312	3	90

3. Expenditures for supplies and services from non-instructional organizational units not specifically identified with cost centers are distributed in the same proportion as personnel expenditures. The following example illustrates this procedure:

Assume a Counseling Department with $81,000 in personnel expenditures and $4,000 in expenditures for supplies and services. The personnel expenditures are distributed to the cost centers in the following manner:

Cost Centers	Personnel Expenditures Distribution	Supplies & Services Expenditures Distribution
5.10 Social & Cultural Development	$15,000	$ 720.00
5.30 Counseling & Advisement	46,000	2,280.00
5.40 Placement Services	8,000	400.00
5.50 Financial Aid Administration	12,000	600.00
TOTAL	$81,000	$4,000.00

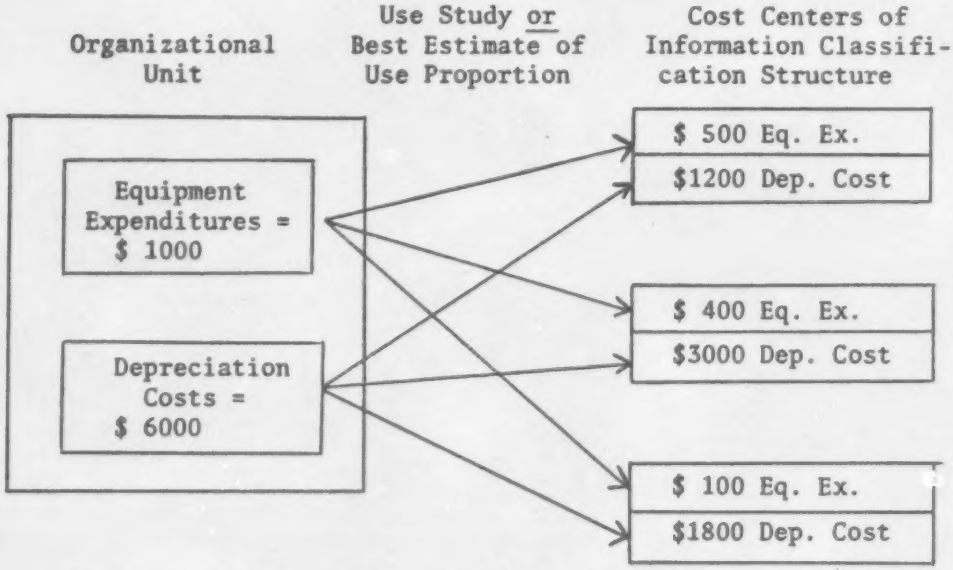
H. Equipment Expenditures and Depreciation Costs - Equipment expenditures are those made during the current fiscal year for equipment as defined in the Florida Community College Accounting Manual. This includes expenditures of Funds 1, 2, and 7 recorded in Accounts 710, Furniture and Equipment, and 730, Library Books and Films. Depreciation costs are derived by taking one-fifth of the total expenditures for equipment purchased during the preceding five year period (including the year being analyzed) and is still inventoried and used by the college. Equipment expenditures and depreciation costs are both reported in Report CA-2. It should be noted that equipment expenditures are reported as an information item, whereas depreciation costs are used in the computation of full cost in Report CA-3.

In the performance of the Direct Cost study, both equipment expenditures and depreciation costs should be distributed from the organizational units (departments) with which they are identified to the cost centers of the ICS on one of the following bases:

1. A use study; or
2. If a use study is not conducted, the best estimate of use; or
3. If neither of these two methods are appropriate, distribute on the basis of a parameter that is most appropriate; i.e., student semester hours for instructional cost centers, full-time equivalent positions for support cost centers, etc.

One method is not specified as standard since in different situations any one of the methods may be preferable to the other two. A use study means that records are maintained on the amount of use made of certain equipment by activities within the cost centers of the ICS. The best estimate of use method means that the department administrator assigns a certain utilization of equipment to the cost centers supported by the department. The parameter method means that one selects a specific utilization parameter (SCH, FTE positions, etc.) which is used to distribute the cost of the equipment to the cost centers.

The following example illustrates the distribution of equipment expenditures and depreciation costs from one organizational unit to three cost centers (note that the proportions may be different for the expenditures and depreciation):


Organizational Unit
Use Study or Best Estimate of Use Proportion
Cost Centers of Information Classification Structure
Equipment Expenditures = $ 1000
Depreciation Costs = $ 6000
$ 500 Eq. Ex.
$1200 Dep. Cost
$ 400 Eq. Ex.
$3000 Dep. Cost
$ 100 Eq. Ex.
$1800 Dep. Cost

These procedures assume that each college has an inventory of equipment which accounts for each item by organizational unit or has records of expenditures for equipment by organizational unit. Since depreciation costs are based on a five-year, straight line depreciation schedule, equipment acquired (and still in use) during the past five years (including the year being costed) should be depreciated by one-fifth of its purchase price. All equipment over five years old will be considered to have zero dollar value for costing purposes.

I. Allocation Procedures - Items F, G, and H above discussed the procedures for distribution of expenditures from the organizational structure for the ICS for direct cost purposes. Once this distribution is accomplished, it is possible to obtain full costs by allocating the expenditures of support functions to the instructional functions.

Support expenditures that can be associated with a particular instructional department, course, or group of courses should be allocated to these when conducting the full cost study. In other words, institutions maintaining usage records for "charge back" purposes should use such records for allocating support costs. These expenditures should be included in the college-wide costs for the specific courses in the CA-3 full cost report. Documentation of back-up records which support such allocations should be maintained for audit purposes. Other support costs should be allocated to instructional courses based on the semester credit loads of the various courses.

Equipment depreciation is allocated for Report CA-3, Full Cost of Instruction. Equipment expenditures for the current year are not included in the allocation procedure.

Reports

Three reports are categorized as cost analysis reports:

CA-1, Identification of Operating Expenditures by Fund
CA-2, Direct Cost of Primary and Support Programs
CA-3, Full Cost of Instruction

Semester Hour (Student Semester Hour - SSH) - Enter the semester credits and equivalents registered for in all terms of the academic year under analysis. Enter according to the standard procedures for enrollment accounting from Report FA-4, Enrollment Funding Data (Student Semester Hours). The semester hours reported on CA-3 must equal those reported on FA-4 for each discipline and cluster. When necessary, carry these out to one decimal place.

Instruc. Pers. Expend. - Enter the unit cost attributable to Instructional Personnel Expenditures. The unit cost is obtained by dividing the number of semester hours into the expenditures for instructional personnel.

Other Instruc. Expend. - Enter the unit cost attributable to Other Instructional Expenditures related to instructional departments:

Administrative, Managerial Personnel Expenditures
Support Personnel Expenditures
Supplies and Services
Equipment Depreciation Cost

Unit cost is obtained by dividing the number of semester hours into the sum of the above four types of expenditures.

College-Wide Expend. - Enter the unit cost attributable to expenditures for support programs. The unit cost is obtained by dividing the number of semester hours into the total expenditures allocated from support programs.

Per Semester Hour - Enter the sum of the entries in the Cost/Student Hour Columns.

Per FTE Student - Enter the result of multiplying the cost per semester hour by 30 (the FTE unit value).

APPENDIX L

Summary of the Unit of Measurement and Funding Methodology Used by the Texas Community Colleges

The unit of measurement used in the Texas community college system to measure production was the student contact hour. There was no conversion of student contact hours into either credit hours or FTEE's.

Training programs are classified as either vocational-technical or as general academic programs. The vocational-technical programs are approved and supervised by the Texas Education Agency. The general ac c programs are approved and supervised by the coordinating board for the Texas college and university system.

The funding methodology depends on the student contact hour for the distribution of state aid. The fall preceding the legislative biennium became the base year for calculating the contact hour cost.

The median overhead cost per contact hour was calculated for each of the two categories and that was the amount that each institution included in its budget projection for overhead. The median direct cost for each of the two categories was also computed for each program. Each school then prepared a projected budget with expenditures calculated by multiplying the number of contact hours for the base year by program times the median overhead rate and the median direct cost rate.

The state general aid request became the amount of the total expenditures from all the colleges minus the amount generated from the local tuition base and federal support. Two problems have plagued the Texas community college system in recent years. The state legislature has failed to provide growth monies for the community colleges and they have

failed to fully fund the state aid requests. However, the overall state aid average in 1978 was 65 percent and from all other sources equal 35 percent.

The tuition rate had some flexibility in that the base of $4.00 per credit hour was required, but the local district had the option of increasing the tuition for enrichment purposes without being penalized.

The Texas community college districts are expected to levy a local tax sufficient to build and operate their plants and to enrich programs.

Each school received the same amount of reimbursement per contact hour by program base on the median cost in the state.

The amount of income that an individual school could put together from the combined sources of state aid based on median cost per contact hour, tuition, federal support, and local tax support was the parameter that that school had to operate within. This allowed for quite a wide range of differences in the resources generated from college to college which resulted in different salary capabilities and varying faculty loads between institutions. An average academic faculty load was 15 contact hours per week while the voc-tech was somewhat higher based on the assumption that academic courses require more preparatory effort and time than vocational courses.

There was no effort to force program uniformity in curriculum or in maximum length. The Texas Education Agency did identify minimum program lengths which indicated the minimum number of clock hours of instruction which must be offered in specific programs was determined. Each school in each category received the same amount of state aid in programs of identical taxonomy.

Skilled Preparatory Occupational Programs

These should operate for at least a minimum of 1,080 clock-hours of instruction. Some of the Industrial Education programs:

Air Conditioning	1080 hours
Air Traffic Control	1080 hours
Aircraft Mechanics	1100 hours
Appliance Repair	1080 hours
Auto Body Repair	1080 hours
Auto Mechanics, Entry level	1080 hours
Auto Mechanics, Journeyman	2000 hours
Automotive Parts Specialist	800 hours
Coin/Operated Machine Repair	1080 hours
Commercial Art	1080 hours
Commercial Fishery Occupation	540 hours
Construction and Maintenance Trades	1080 hours
Cook/Chef	540 hours
Cosmetology	1500 hours
Culinary Arts	540 hours
Diesel Mechanics, Entry Level	1080 hours
Diesel Mechanics, Journeyman	2000 hours
Drafting	1080 hours
Farm Machinery Repair	1080 hours
Fire Protection	700 hours
Floral Design and Shop Management	540 hours
Foundry	540 hours

Heavy Equipment Mechanic	1080 hours
Horology	1400 hours
Industrial Management	540 hours
Industrial Electricity	1080 hours
Instrumentation	800 hours
Jewelry Repair	1080 hours
Law Enforcement	700 hours
Machine Shop	1080 hours
Maintenance Engineering	1080 hours
Marine Construction	1080 hours
Masonry	1080 hours
Mobile Home Installation and Service	540 hours
Occupational Safety and Health	540 hours
Offset Printing	1080 hours
Pattern Drafting and Trading	540 hours
Photographer-Illustrator	1080 hours
Photography	1080 hours
Piano Tuning	850 hours
Plumbing	1080 hours
Printing and Publishing	1080 hours
Public Works Maintenance	1080 hours
Radio and TV Service	1080 hours
Refrigeration Mechanic	1080 hours
Saddle and Tack Making	800 hours
Sewing Machine Repair	540 hours
Sheet Metal	1080 hours

Shoe Repair . . . . . 540 hours

Small Engine Repair . . . . . 1080 hours

Sports Equipment Repair . . . . . 540 hours

Tailoring . . . . . 1080 hours

Telephone Equipment Repair . . . . . 1080 hours

Truck and Heavy Equipment Operator . . . . . 540 hours

Upholstery . . . . . 1080 hours

Water Utilities Operation . . . . . 540 hours

Welding, Combination . . . . . 1400 hours

Welding, Specialized . . . . . 700 hours

Adult Supplementary

Such courses are organized around those special skills and knowledges needed to update or upgrade groups of individuals, based upon the needs of the industry or industries involved. The length of the course may vary depending upon the complexity of the skills needed.

Apprenticeship Related Instruction

The length of time an apprentice must spend in training on-the-job is determined by the industry and will vary from one industry to another. A minimum of 144 hours per year of related instruction is recommended in federal apprenticeship regulations. Both the on-the-job training and the related instruction may vary for each occupation.

Florida
Community
Colleges

FULL COST SUMMARY REPORT FROM CA-3
(1976 - 1977)
FOR
BREV BROW CFLA CHIP DAYT EDIS FJAX FKEY GULF
HILL INDR LCTY LSUM MANA MIAM NFLA OKAL PALM
PASC PENS POLK ST.J ST.P SANF SEMI SFLA TALL VALE

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Codes	Programs	FTE	Instructional Costs Dollar/FTE		Other Instructional Costs Dollar/FTE		College-Wide Costs Dollar/FTE		Total Cost/ FTE
1.1001	Agricul. + Nat. Res.	44.2	536.77	35	190.61	13	794.60	52	1521.98
1.1002	Architect + Environ.	36.2	724.13	52	90.48	7	570.80	41	1385.40
1.1003	Area Studies	12.0	0.00	0	61.20	8	718.80	92	780.00
1.1004	Biological Sciences	7,460.0	550.28	38	146.94	10	742.43	52	1439.66
1.1005	Business + Management	3,404.6	436.93	34	61.19	5	790.18	61	1288.28
1.1006	Communications	351.3	834.09	48	156.97	9	761.01	43	1752.07
1.1007	Computer Info. Sci.	116.2	485.62	34	275.77	20	650.48	46	1411.86
1.1008	Education	5,546.2	778.87	44	242.00	14	747.99	42	1768.85
1.1009	Engineering	95.0	1183.41	57	221.90	11	667.12	32	2072.44
1.1010	Fine + Applied Arts	10,418.2	695.46	44	146.22	9	746.16	47	1587.84
1.1011	Foreign Languages	1,663.4	719.21	46	80.46	5	766.01	49	1565.68
1.1012	Health Professions	12.7	239.68	22	58.16	5	791.02	73	1088.87
1.1013	Home Economics	131.9	745.85	42	277.28	16	752.98	42	1776.12
1.1014	Law	22.1	519.58	34	153.07	10	843.11	56	1515.58
1.1015	Letters	17,746.7	553.95	43	63.96	5	680.39	52	1298.29
1.1016	Library Science	26.4	547.69	38	42.23	3	846.95	59	1436.87
1.1017	Mathematics	11,584.1	523.84	39	63.44	5	740.23	56	1327.50
1.1018	Military Science	38.7	262.49	24	43.53	4	775.43	72	1081.45
1.1019	Physical Sciences	7,840.7	606.27	41	137.38	9	740.99	50	1484.63
1.1020	Psychology	7,737.2	504.39	39	54.57	4	742.78	57	1301.73
1.1021	Public Affairs	128.0	747.36	45	80.60	5	829.10	50	1657.06
1.1022	Social Sciences	18,238.4	458.85	36	54.36	4	749.23	59	1262.43
1.1049	Interdiscip. Studies	1,821.2	486.91	35	127.30	9	764.83	55	1379.04
TOTAL ADVANCED + PROFES.		94,475.4	568.82	40	96.95	7	745.60	53	1411.37

FULL COST SUMMARY REPORT FROM CA-3 (cont.)

Codes	Programs	FTE	Instructional Costs Dollar/FTE		Other Instructional Costs Dollar/FTE		College-Wide Costs Dollar/FTE		Total Cost/ FTE
1.2100	Agriculture	1,100.7	655.89	42	191.79	12	722.97	46	1570.63
1.2200	Distributive	5,571.2	443.68	33	147.45	11	737.56	56	1328.69
1.2300	Health	9,201.5	1061.18	49	358.04	17	734.08	34	2153.29
1.2400	Home Economics	2,950.0	528.91	37	209.45	15	701.54	49	1439.91
1.2500	Office	13,613.8	509.97	37	149.47	11	736.04	53	1395.44
1.2600	Trade and Industrial	11,467.1	554.97	36	265.92	17	709.56	46	1530.44
1.2700	Technical	9,692.5	625.12	39	225.68	14	742.40	47	1593.20
TOTAL OCCUPATIONAL		53,596.9	632.25	40	227.67	14	729.18	46	1589.10
1.3100	Compensatory	5,103.8	573.07	38	137.65	9	779.64	52	1490.36
1.3200	Adult Elem. and Sec.	8,730.4	400.20	32	169.83	14	677.42	54	1247.46
TOTAL DEVELOPMENTAL		13,834.1	463.96	35	158.07	12	715.13	53	1337.19
1.4100	Citizenship	1,476.0	427.56	29	359.53	25	673.91	46	1461.01
1.4200	Avocational	1,428.1	432.49	28	347.48	23	748.43	49	1528.39
TOTAL COMM. INSTR. SRVS.		2,904.1	432.88	29	353.63	24	710.54	47	1497.07
COLLEGE TOTAL		164,813.3	577.5	39	148.96	10	737.07	50	1463.54

Coordinating Board, Texas College and University System

DEFINITIONS OF THE ELEMENTS OF INSTITUTIONAL COSTS

The definitions of educational and general functions set out below form a part of a uniform system of reporting for institutions of higher education in Texas as required by Section 22, House Bill 1, Chapter 12, Acts of the Fifty-ninth Legislature, Regular Session, 1965. These definitions were officially adopted by the Coordinating Board on January 18, 1974. The listings of "examples" are not to be interpreted as necessarily meaning that each institution will have expenditures in all categories, but are intended only as illustrations of the named functions. Excluded from these elements and definitions are student services for which the legislature has authorized fees under Section 54.503, Vernon's Texas Education Code, (S.B. 6, Chapter 12, Acts of the Fifty-sixth Legislature, Second Called Session, 1959, p. 99), and all auxiliary enterprise operations and costs related thereto.

A. GENERAL ADMINISTRATION AND STUDENT SERVICES

1. General Administration

Definition. Salaries, wages, and all other costs for the following functions and activities.

NOTE: Because funds to support the functions performed by governing boards and central administrative offices for certain public senior college and university systems having responsibility for more than one academic institution have historically been separately requested and appropriated, the costs for these boards and offices are excluded from the defined elements.

a. Government of the institution.

The costs incurred on behalf of the governing body in discharging its responsibilities. Example: Governing Board.

b. Executive direction and control.

The costs incurred in the executive direction, control and implementation of policies of the governing board and the chief executive officer. Examples: Chief Executive's Office (President), Chief Academic Officer's Office, Chief Business Officer's Office, Assistant(s) to the President. Excluded are costs of academic administrative functions defined in "Instructional Administration Expense."

c. Business and fiscal management.

The costs incurred in the attainment of financial goals through proper effective accounting records and procedures and budgetary and cost controls. Examples: Business Office, Fiscal Office, Comptroller's Office, Personnel Services, Purchasing Office, Property and Inventory Control, Internal Audit, Systems and Procedures.

2. Student Services

a. Admissions and registration.

The costs of administering undergraduate and graduate admission activities, processing and maintenance of student records and reports and the registration of students. Examples: Registrar's Office, Dean of Admissions.

b. Other Student Services.

The costs of administering and coordinating the development and maintenance of the student life program including counseling with students on disciplinary and other non-academic problems, the guidance of foreign students, student and graduate placement, and student financial aids. Examples: Chief Student Affair's Office, Dean of Men, Dean of Women, Testing and Guidance, Student Life, International Office, Placement, and Student Financial Aids.

B. GENERAL INSTITUTIONAL EXPENSE

Definition. Expenses of a general nature which benefit the entire institution and are not related solely to any specific department or division. The definition of functions within this element should not be interpreted as implying that each institution should engage in all the activities defined. Included are salaries, wages, and all other costs for the following functions, services, or activities:

1. Public informational activities, including bulletins, catalogues, publications, exhibits, and news service.

2. Institutional memberships.

3. Commencement exercises for the graduating classes. Included only are costs of speakers, arrangements, and caps and gowns for guests.

4. Convocations and public lectures.

5. Official functions.

6. Mail Services, excluding the cost of postage.

7. Legal fees and expense required to protect the interests of the institution and the State. In the case of public senior colleges and universities, these expenses must be authorized by the Attorney General.

8. Development activities.

9. Student band.

10. The costs of maintaining and securing records pertaining to alumni of the institution for evaluation of the educational programs of the institution.[1]

11. Telephone central office. Does not include long distance call charges nor cost of telephone instruments. These costs are to be charged to the using departments.

12. The cost of conducting studies for the improvement of the institution.

13. Insurance (other than property and those covered under staff benefits).

14. Other general institutional expense items, except as follows:

    a. Service department charges (except for mail service and telephone central office) should be allocated to the users, e.g.: Stenographic bureaus, central stores, central computer operation costs, printing shops, copy centers, supply centers, microfilm services, etc.

    b. Any item of cost specifically identified within the definition of an Element of Institutional Cost should be included in that cost element and not "General Institutional Expense".

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[1] For the 1973-75 biennium, the expenditure of educational and general and constitutional funds by Public Senior Colleges and Universities to support alumni organizations or activities is prohibited under Sec. 38, Article IV, H.B. 139, Acts of the Sixty-Third Legislature, 1973.

C. STAFF BENEFITS

Definition. Premiums or costs toward staff benefits programs for employees. Examples of staff benefits authorized by the legislature are:

1. Staff group insurance premiums.

2. Faculty Development Leaves.

3. Old Age and Survivors Insurance.

4. Workman's Compensation Insurance.

D. RESIDENT INSTRUCTION

Definition. Resident instruction includes all functions directly related to teaching, classified as follows:

1. Faculty Salaries.

   Definition. Salaries or wages of those engaged in the teaching function, including heads of teaching departments. Included also are laboratory assistants, teaching assistants, teaching fellows and lecturers who are responsible for, or in charge of, a class or class section, or a quiz, drill, or a laboratory section. Not included are the salaries or wages of guest lecturers or of student assistants, laboratory assistants, and graders whose duties involve grading, clerical functions, store keeping, and preparations of class or laboratory material or other subordinate functions.

2. Departmental Operating Expense.

   Definition. Salaries, wages, supplies, travel, office furniture, equipment, and incidental operating expense for the operation of instructional departments, other than faculty salaries. Included here are the salaries and wages of guest lecturers and of student assistants, laboratory assistants, and graders whose duties involve grading, clerical functions, store keeping, and preparation of class or laboratory material or experiments or other subordinate functions. Includes teaching equipment customarily assigned to teaching departments and provides for replacement and up-dating of teaching equipment as well as acquisition of new items. Also includes costs of practice teaching other than faculty salaries, and all direct or prorated computer costs related to resident instructional programs.

3. Instructional Administration Expense.

Definition. Salaries, wages, supplies, travel, equipment, and incidental operating expense of the office of academic deans or directors of major teaching department groupings into colleges, schools, or divisions, and the office of the dean or director of graduate studies. Examples of activities include, but are not limited to, the following: instructional budget planning; faculty recruitment, development, assignment, and utilization; curricular expansion and revision; student academic advisement; maintenance of scholastic and admission standards. Not included are the offices of the heads of teaching departments.

4. Organized Activities Related to Instructional Departments.

Definition. All costs of activities or enterprises separately organized and operated in connection with instructional departments primarily for the purpose of giving professional training to students as a necessary part of the educational work of the related departments. Examples of such organized activities are college farms, creameries, poultry processing plants, veterinary hospitals, nursery schools, and home management houses. Does not include cost of practice teaching. Where these activities are not conducted primarily for educational purposes, they should be excluded from the definition of this element of cost.

E. VOCATIONAL TEACHER TRAINING SUPPLEMENT

Definition. The matching part of salaries, wages, and such other costs as are required to finance the Vocational Teacher Training Program according to provisions of the Texas State Acceptance Act and the Plan of the State Board of Vocational Education for Vocational Teacher Training under the Smith-Hughes and George Barden Acts.

F. LIBRARY

Definition. Salaries, wages, other operating costs, books, periodicals, binding costs, and equipment of separately organized libraries (including archives).

G. ORGANIZED RESEARCH

Definition. Salaries, wages, and other costs of separately organized research divisions such as research bureaus, research institutes, and separately budgeted or financed research investigations. Departmental research not separately budgeted or financed and contract research and services are not included.

H. EXTENSION AND PUBLIC SERVICE

Definition. All costs of activities designed primarily to serve the general public, including correspondence courses, adult study courses, public lectures, radio and television stations, institutes, workshops, demonstrations, package libraries, and similar activities.

I. PHYSICAL PLANT OPERATION AND MAINTENANCE

1. Physical Plant General Services.

Definition. Salaries, wages, supplies, travel, equipment, and other operating expenses to carry out the duties of physical plant administration, planning, and general services. Examples of the activities included are:

a. Administration

Salaries, wages, travel, equipment, and other operating costs required to administer one or more functional units of the Physical Plant.

b. Planning

Salaries, wages, travel, equipment, and other costs required to prepare architectural and engineering plans and specifications, for the expansion, renovation, and rehabilitation of physical plant facilities, excluding fees for new construction.

c. Other General Services, including

(1) Acquisition and repair of general classroom and laboratory furniture. Does not include office furniture.

(2) Central receiving and store of supplies and equipment.

(3) Safety, including fire, occupational, radiation, health and sanitation safety.

(4) Garbage and trash disposal.

(5) Hauling, moving and storing.

(6) Property insurance.

(7) Truck and automobile expense in general service of the institution.

2. Campus Security.

Definition. Salaries, wages, supplies, travel, equipment, and other operating expenses to carry out the traffic and security services of the institution.

3. Building Maintenance.

Definition. Costs, including salaries, wages, supplies, materials, equipment, services, and other expenses, necessary to keep each building in good appearance and usable condition and prevent the building from deteriorating once it has been placed in first class condition for that type and age of building. Does not include auxiliary enterprise buildings. Building Maintenance includes minor repairs and alterations, costs of materials, hire of personnel, and other necessary expenses for the repair and/or painting of the following: roofs, exterior walls, foundations, flooring, ceilings, partitions, doors, windows, plaster, structural ironworks, screens, window shades, venetian blinds, plumbing, heating and air-conditioning equipment within or a part of the building, electric wiring, light fixtures (including the replacement of lamps), washing of all outside window surfaces, built-in shelving, and other related items.

4. Custodial Services.

Definition. Costs including salaries, wages, supplies, materials, equipment, services, and other expenses necessary to keep the buildings in a clean and sanitary condition. Does not include auxiliary enterprise buildings. These services include care of the floors, stairways and landings, and restrooms; cleaning chalkboards, inside of windows, walls, and room furniture and fixtures; assigned dusting, removal of waste paper and refuse and other related duties.

Common operations include: Mopping, sweeping, waxing, renovating of floors (sanding and refinishing of floors are excluded); dusting, polishing of furniture and fixtures such as venetian blinds, partitions, pictures, maps, radiators, etc.; cleaning of chalkboards, chalk trays, erasers, and replacement of chalk; washing and dusting of walls, cleaning and disinfecting commodes and urinals, cleaning and washing other fixtures, walls, and partitions, and replenishing supplies for restrooms; the emptying and cleaning of waste receptacles, and dusting and cleaning of windows, and other glass surfaces; sweeping and cleaning of entrances, and opening and/or closing buildings, doors, and windows.

5. Grounds Maintenance.

Definition. Costs including salaries, wages, supplies, materials, equipment, services, and other expenses relating to the upkeep of all lands designated as campus proper (improved and unimproved) not occupied by actual buildings, including any court, patio, and/or inner garden or court enclosed by buildings. Grounds Maintenance begins after the site improvements are complete.

Phases of Grounds Maintenance are:

a. Land Improvements

(1) Permanent
Lawns, trees, shrubs, etc.

(2) Seasonal
Flowers, bulbs, etc.

b. Circulation Systems

(1) Vehicular
Streets and roads - improved and unimproved; parking areas - improved and unimproved; traffic controls - signal lights, signs and barriers.

(2) Pedestrian
Walks and paths - improved and unimproved.

c. Other Activities

(1) Campus lighting
Streets, campus.

(2) Irrigation Systems

(3) Non-structural improvements
Walls, fences, fountains, campus furniture, others.

(4) Ancillary enterprises
Nursery, Greenhouse - area for special academic study.

6. Utilities

Definition. All costs of purchase, manufacture and delivery of utility services, including: electricity, steam heat, water (hot, cold, or chilled), storm sewers, sanitary sewers, compressed air, gas, clocks and bells,

J. SPECIAL ITEMS

Definition. The costs of those items which are not included in any of the other elements, or, the costs of those items which are peculiar to the particular institution.

K. MAJOR REPAIRS AND REHABILITATION OF BUILDINGS AND FACILITIES

Definition. This item includes major repairs, rehabilitation, and renovation of existing buildings and facilities (including repairs and alterations to production and distribution facilities for utilities where such facilities do not primarily serve auxiliary enterprises) including salaries, wages, and costs of materials for such items; but does not include routine, ordinary, annual, or periodic maintenance.

Public Junior College Cost Survey

METHOD OF COMPUTING OVERHEAD* MEDIAN
COST PER CONTACT HOUR

Fiscal Year 1976-77

	Median Cost Per Contact Hour for All Institutions
General Administration and Student Services	$ .33
General Institutional Expense	.07
Staff Benefits	.07**
Library	.11
	$ .58

	Vocational-Technical Programs	General Academic Programs
	$ .58	$ .58
Instructional	.12	.08
Organized Activities	.03	.02
Total Overhead* Median Cost Per Contact Hour	$ .73	$ .68

* Allocated costs except for Faculty Salaries and Departmental Operating Expense. Does not include costs for Extension and Public Service, Physical Plant Operation and Maintenance and Major Repairs and Rehabilitations of Buildings and Facilities.

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** Does not include expenditures for group insurance premiums.

Public Junior College Cost Survey

SUMMARY OF STATEWIDE MEDIAN COST PER CONTACT HOUR FOR
VOCATIONAL-TECHNICAL PROGRAMS

Fiscal Year 1976-77

	Faculty Salaries	Departmental Operating Expense	Overhead*	Total
Agriculture	$ 1.59	$ .65	$ .73	$ 2.97
Homemaking	1.08	.17	.73	1.98
Restaurant Management	.90	.04	.73	1.67
Mid-Management	.64	.05	.73	1.42
Other Distribution & Management	.74	.07	.73	1.54
Real Estate	.62	.03	.73	1.38
Secretarial	.99	.23	.73	1.95
Data Processing	1.12	2.31	.73	4.16
Welding	.80	.40	.73	1.93
Automotive	.81	.30 [1/]	.73	1.84
Airframe & Power Mechanic	1.64 [1/]	.34 [1/]	.73	2.71
Fire Protection	.94	.05	.73	1.72
Law Enforcement	.91	.05	.73	1.69
Machine Shop	1.05	.23	.73	2.01
Air Conditioning	.84	.17	.73	1.74
Cosmetology	.52	.23	.73	1.48
Other Industrial Education	.88	.16	.73	1.77
Licensed Vocational Nursing	.74	.07	.73	1.54
Associate Degree Nursing	1.99	.23	.73	2.95
Dental Hygiene	2.16	.37	.73	3.26
Medical Laboratory	1.38	.61	.73	2.72
Respiratory Therapy	1.69	.44	.73	2.86
Dental Assisting	1.33	.39	.73	2.45

SUMMARY OF STATEWIDE MEDIAN COST PER CONTACT HOUR FOR
VOCATIONAL-TECHNICAL PROGRAMS (cont.)

	Faculty Salaries	Departmental Operating Expense	Overhead*	Total
Operating Room Technology	$ 1.48	$ .13	$ .73	$ 2.34
Other Health	1.03	.16	.73	1.92
Career Pilot	2.15	3.43	.73	6.31
Drafting & Design	1.00	.10	.73	1.83
Electronics	1.20	.38	.73	2.31
Marine Technology	1.61 1/	.90 1/	.73	3.24
Other Technical	1.28	.42	.73	2.43
Related	.85	.06	.73	1.64
Adult Apprentice	.79	.20	.73	1.72
Adult Vocational (Supplementary and Preparatory)	.57	.11	.73	1.41
Cooperative Work Experience	.47	.05	.73	1.25

* "Overhead" includes allocated costs other than Faculty Salaries and Departmental Operating Expense. Does not include costs for Extension and Public Service, Physical Plant Operation and Maintenance and Major Repairs and Rehabilitations of Buildings and Facilities and expenditures for staff insurance benefits.

1/ Two Institutions.

PROPOSED CONTACT HOUR RATES FOR
VOCATIONAL-TECHNICAL PROGRAMS IN PUBLIC JUNIOR/COMMUNITY COLLEGES
RECOMMENDED BY THE JUNIOR COLLEGE FORMULA ADVISORY COMMITTEE

	Median Cost Per Contact Hour 1977	Recommended Rates (1) 1980	1981
Agriculture	2.97	3.58	3.80
Homemaking	1.98	2.38	2.54
Distribution and Marketing			
Restaurant Management	1.67	2.01	2.14
Mid-Management	1.42	1.71	1.82
Real Estate	1.38	1.66	1.77
Other Distribution & Marketing	1.54	1.85	1.97
Office Occupations			
Secretarial and General Business	1.95	2.35	2.50
Business Data Processing	4.16	5.01	5.33
Industrial Education			
Welding	1.93	2.32	2.47
Automotive	1.84	2.21	2.36
Cosmetology	1.48	1.78	1.90
Fire Protection	1.72	2.07	2.20
Airframe & Power Mechanic	2.71	3.26	3.47
Law Enforcement	1.69	2.03	2.17
Machine Shop	2.01	2.42	2.58
Air Conditioning	1.74	2.10	2.23
Other Industrial Education	1.77	2.13	2.27

PROPOSED CONTACT HOUR RATES FOR
VOCATIONAL-TECHNICAL PROGRAMS IN PUBLIC JUNIOR/COMMUNITY COLLEGES
RECOMMENDED BY THE JUNIOR COLLEGE FORMULA ADVISORY COMMITTEE (cont.)

	Median Cost Per Contact Hour 1977	Recommended Rates (1) 1980	1981
Health Occupations			
Associate Degree Nursing	2.95	3.55	3.78
Dental Assisting	2.45	2.95	3.14
Dental Hygiene	3.26	3.93	4.18
Medical Laboratory	2.72	3.28	3.49
Respiratory Therapy	2.86	3.44	3.67
Vocational Nursing	1.54	1.85	1.97
Operating Room Technology	2.34	2.82	3.00
Other Health Occupations	1.92	2.31	2.46
Technical Education			
Career Pilot	6.32	7.61	8.10
Drafting & Design	1.83	2.20	2.35
Electronics	2.31	2.78	2.96
Marine Technology	3.24	3.90	4.15
Other Technical Education	2.43	2.92	3.11
Related	1.64	1.98	2.10
Cooperative Work Experience & Seminar Courses	1.25	1.51	1.60
Adult Vocational (Supp. and Prep.)	1.41	1.70	1.81
Adult Apprenticeship	1.72	2.07	2.20

(1) Provides for annual increases for inflation of 6.4 for each year from 1978 through each year of the biennium.

Public Junior College Cost Survey

SUMMARY OF STATEWIDE MEDIAN COST PER CONTACT HOUR FOR GENERAL ACADEMIC PROGRAMS

Fiscal Year 1976-77

	Faculty Salaries	Departmental Operating Expense	Overhead*	Total
Agriculture and Natural Resources	$ 1.95	$ .21 2/	$ .68	$ 2.84
Architecture and Environmental Design	.99 1/	.28 2/	.68	1.95
Biological Sciences	.87	.19	.68	1.74
Business and Management	.87	.05	.68	1.60
Communications	2.22	.30	.68	3.20
Computer and Information Sciences	1.25	.10	.68	2.03
Education	1.23	.17	.68	2.08
Engineering	1.07	.06	.68	1.81
Fine and Applied Arts	1.86	.40	.68	2.94
Foreign Languages	1.37	.07 2/	.68	2.12
Health Professions	1.42 2/	.13 2/	.68	2.23
Home Economics	1.03	.15	.68	1.86
Letters	1.03	.06 2/	.68	1.77
Library Science	1.58 3/	.24 2/	.68	2.50
Mathematics	1.10	.05	.68	1.83
Physical Sciences	1.04	.19	.68	1.91
Psychology	.81	.04	.68	1.53
Social Sciences	.83	.03	.68	1.54

* "Overhead" includes allocated costs other than Faculty Salaries and Departmental Operating Expense. Does not include costs for group insurance premiums, Extension and Public Service, Physical Plant Operation and Maintenance, and Major Repairs and Rehabilitations of Buildings and Facilities

1/ Four Institutions

2/ Two Institutions

3/ Five Institutions

1/11/78

RECOMMENDED FORMULA FOR
STATE-SUPPORT OF GENERAL ACADEMIC PROGRAMS

Public Junior Colleges
1979-81 Biennium

Base Period contact hours (Summer Session 1978, Fall Semester 1978, and Spring Semester 1979) times the following rates equals dollar request for State-support of general academic programs.

	Rates Per Base Period Contact Hour	
	Fiscal Year 1980	Fiscal Year 1981
Agriculture and Natural Resources	$ 3.42	$ 3.64
Architecture and Environmental Design	2.34	2.49
Biological Sciences	2.10	2.23
Business and Management	1.93	2.05
Communications	3.85	4.10
Computer and Information Sciences	2.45	2.61
Education	2.50	2.66
Engineering	2.18	2.32
Fine and Applied Arts	3.54	3.77
Foreign Languages	2.55	2.71
Health Professions	2.68	2.85
Home Economics	2.25	2.39
Letters	2.13	2.27
Library Science	3.01	3.20
Mathematics	2.20	2.34
Physical Sciences	2.30	2.45
Psychology	1.84	1.96
Social Sciences	1.85	1.97

NOTE: Does not include Faculty and Staff Group Insurance